Section V

EXTRACTION SYSTEMS

3-21. Platform Extraction Force Transfer Coupling

Inspect and maintain the components of the PEFTC extraction system as outlined in TM 10-1670-240-20/TO 13C7-49-11.

a. Testing Actuator. Before each use, test the actuator as described below.

(1) Torsion Spring. Turn the actuator arm all the way around until the arm stops in the cocked position. Let go of the arm, and the torsion spring should move the arm back to the starting or release position. If the spring does not cause the arm to return to the starting or release position, replace the actuator.

(2) Cam Arm Spring. Turn the cam arm up to the cocked position. Let go of the arm, and the cam arm spring should move the cam arm back to the starting or release position. If the spring does not cause the cam to return to the starting or release position, replace the actuator.

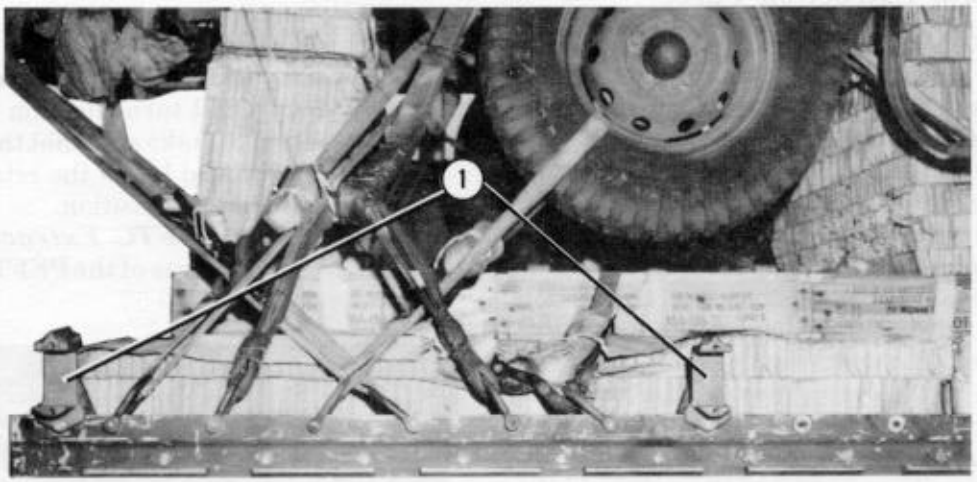
(3) Cam and Bridle Retainer. Hold the retainer down, and turn the cam arm up to the cocked position to make sure that the cam engages the retainer pin and keeps the retainer pin from turning to the release position.

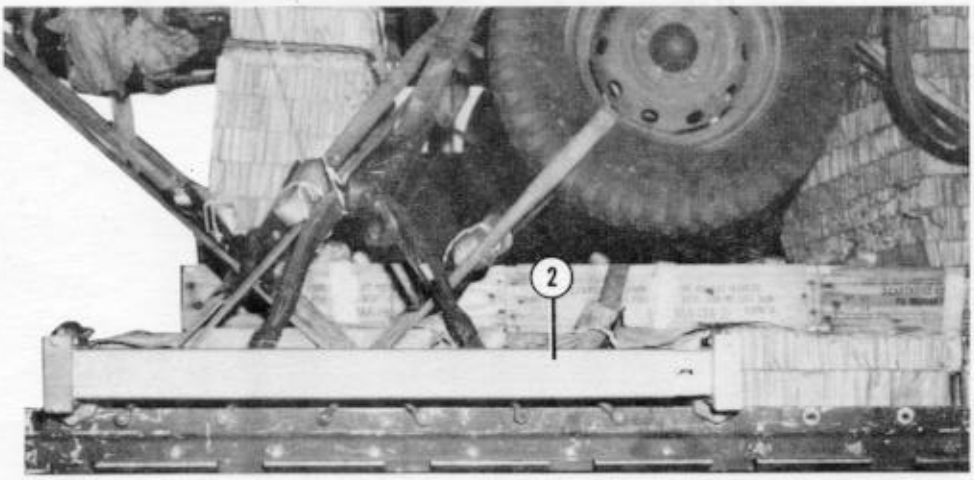
b. Installing PEFTC Extraction System. Install the components of the PEFTC as shown in Figures 3-50 through 3-55.

CAUTION

Use a wrench to tighten all nuts. The nuts should be tight enough to keep them from loosening during transport and airdrop.

Note: The PEFTC cannot be used on the type V or LAPE platform. (Exception: For Air Force training loads, the PEFTC may be used on the LAPE platform.)





(1) Bolt the required number of guidance tube support brackets to the right rail.

Note: The number of brackets and the clevis holes to be used are given in the specific rigging manual.

(2) Bolt the required number of guidance tubes to the brackets.

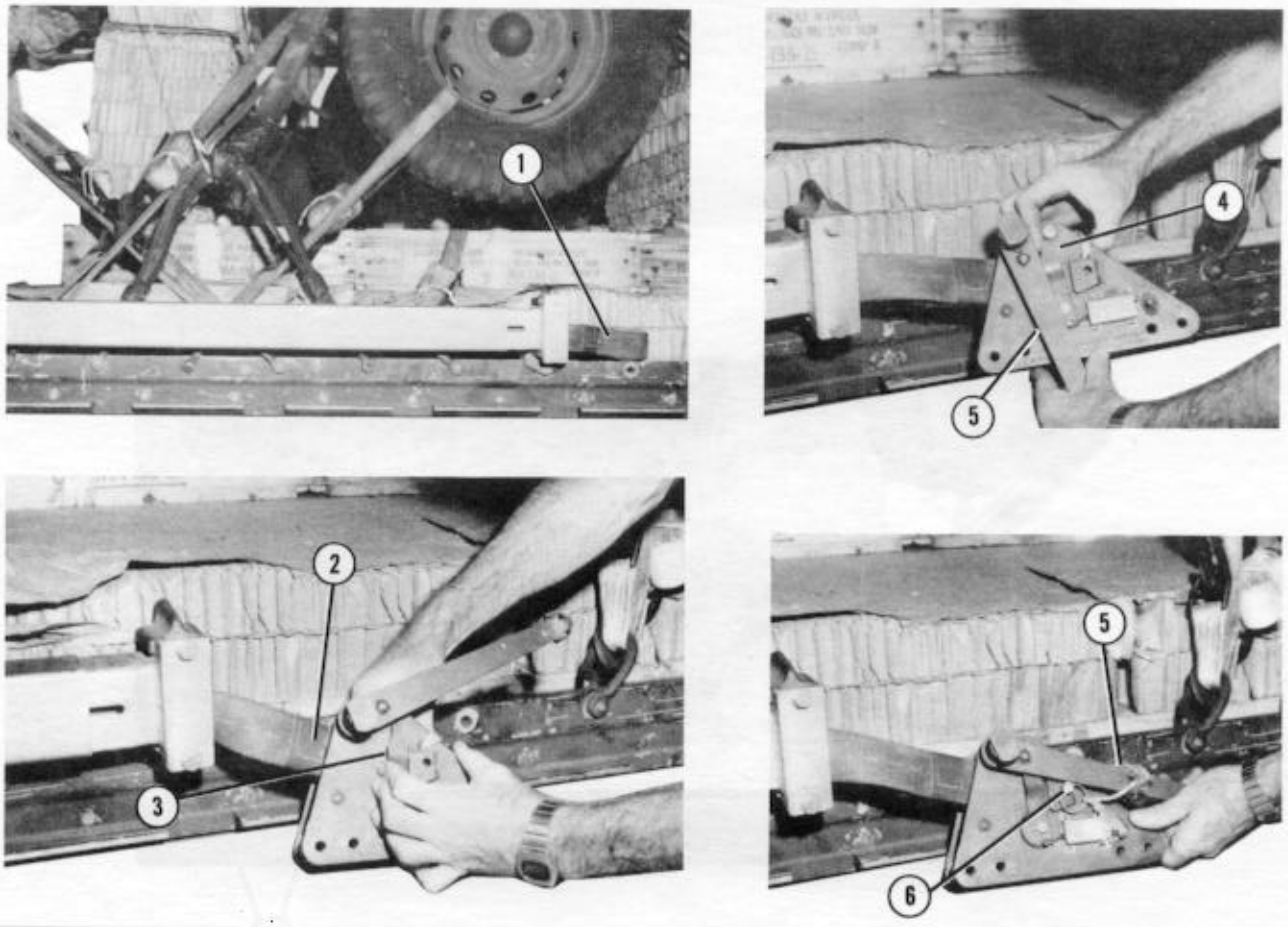
Notes:

1. **This manual shows installation of components on the right rail. Bolt the components to the left rail in the same way.**
2. **Bolt the guidance tubes on the outside of the rails with the inner tubes bolted to the front brackets.**
3. **When platform suspension slings are used, you must place them inboard of the guidance tubes.**

Figure 3-50. Guidance tubes installed

CAUTION

The actuator arm extension pin MUST be secured in the side plate or you MUST remove the pin.



1. Run one end of the extraction bridle through each guidance tube.
2. Put the end loop of the extraction bridle on the bridle retainer of the uncocked right-hand actuator.
3. Hold the bridle and the bridle retainer pin in position, and cock the actuator by turning the cam arm up.
4. Hold the cam arm up, and let go of the bridle.
5. Turn the actuator arm around until the arm stops.
6. Insert the safety pin.

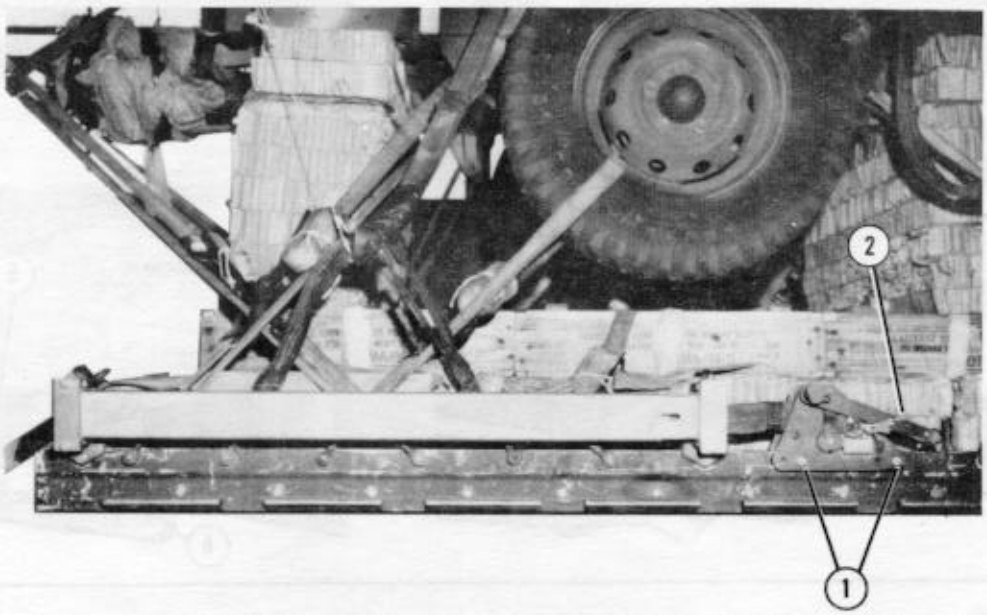
CAUTION

The safety pin MUST be removed after the load has been positioned in the aircraft.

Figure 3-51. Bridle installed and actuator cocked

CAUTION

The A and B mounting holes are identified on each actuator. The A holes are used for the 8-foot platforms, and the B holes are used for the 12-, 16-, and 20-foot platforms.

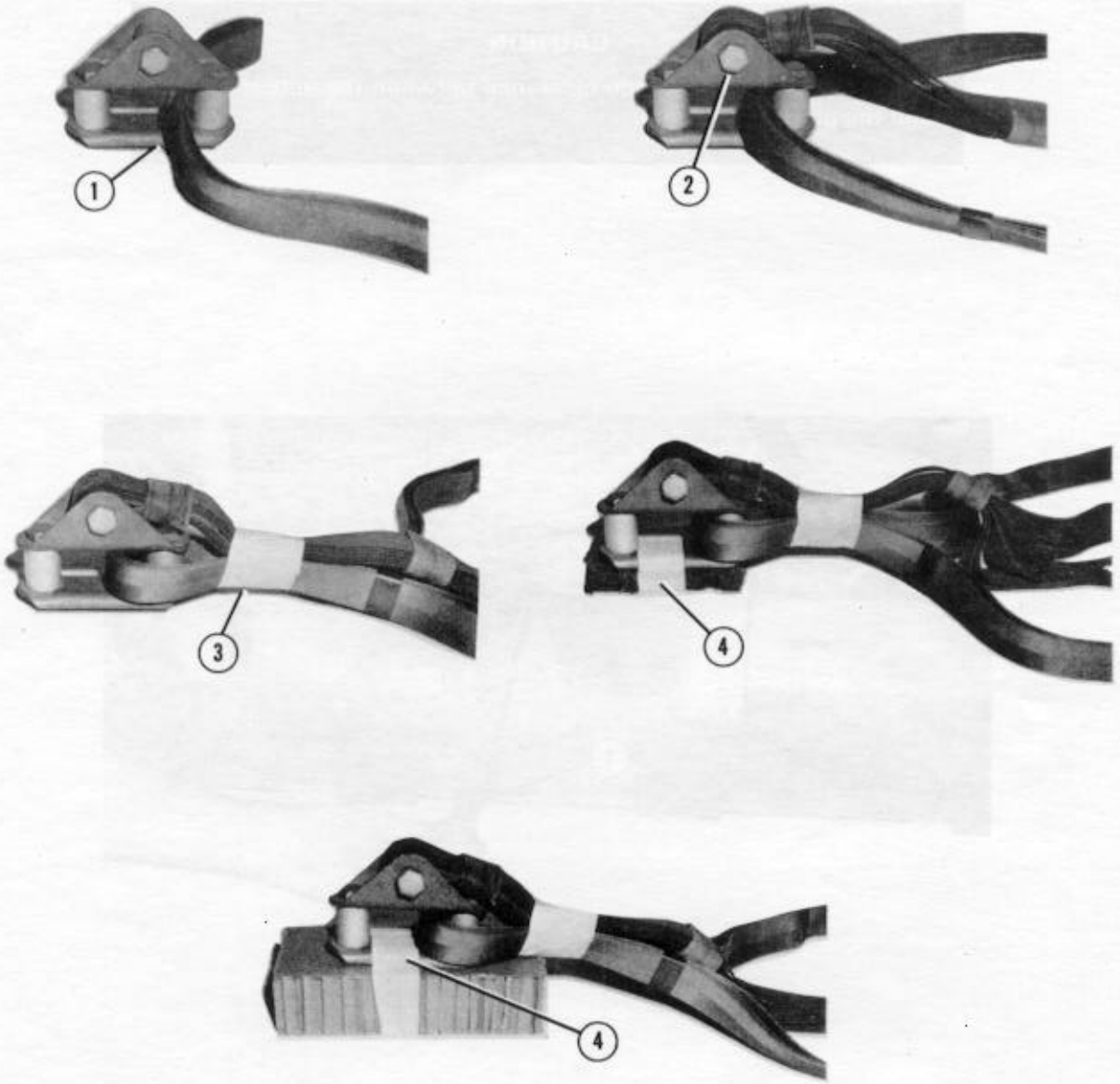


(1) Using the appropriate mounting holes, bolt the actuator to the right side rail.

Note: The clevis holes to be used will be given in the specific rigging manual.

(2) Make a shock-absorbing tie and safety pin (type III nylon cord) according to TM 10-1670-240-20/TO 13C7-49-11.

Figure 3-52. Actuator bolted to right side rail



(1) Extend the extraction bridle toward the rear, and remove all twists and turns. Run the free end through the link assembly. Adapt the procedures in Figures 3-51 and 3-52, and bolt the left-hand actuator to the left rail.

(2) Bolt one end of the deployment line to the top bolt of the link assembly.

Note: The 16-foot (2-loop), type XXVI nylon sling or the 16-foot (3-loop), type X nylon sling is used as a deployment line with the PEFTC.

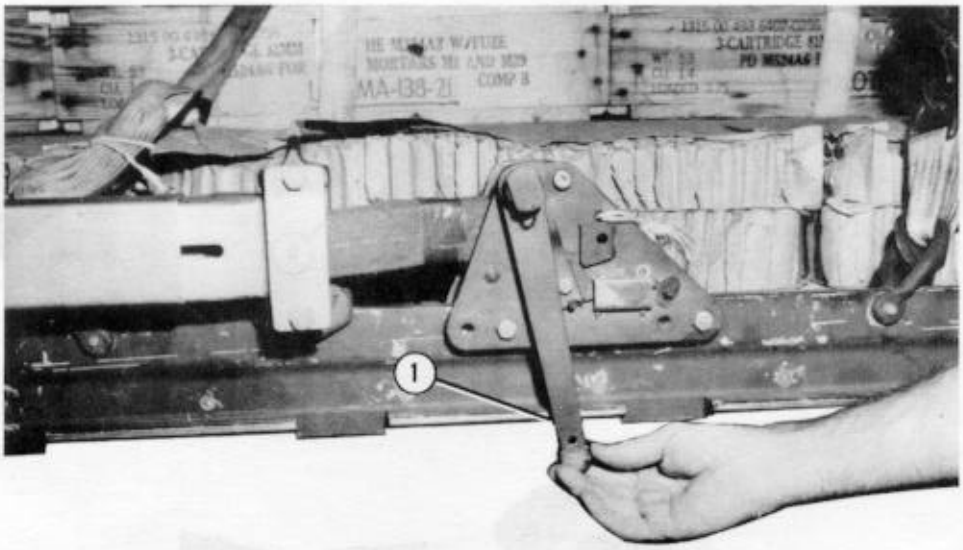
(3) Center the coupling link assembly on the extraction bridle, and tape the extraction bridle and the deployment line together in front of the link assembly using two turns of masking tape.

(4) Tape a piece of felt or honeycomb to the bottom of the coupling link assembly. (This will prevent the link from damaging the floor of the aircraft.)

Figure 3-53. Bridle and deployment line installed and coupling link assembly padded

CAUTION

There MUST be a 1/4-inch clearance between the actuator arm and the platform indents.



(1) Verify the position of the actuator on each rail as follows:

a. Hold the actuator arm in place, and remove the safety pin.

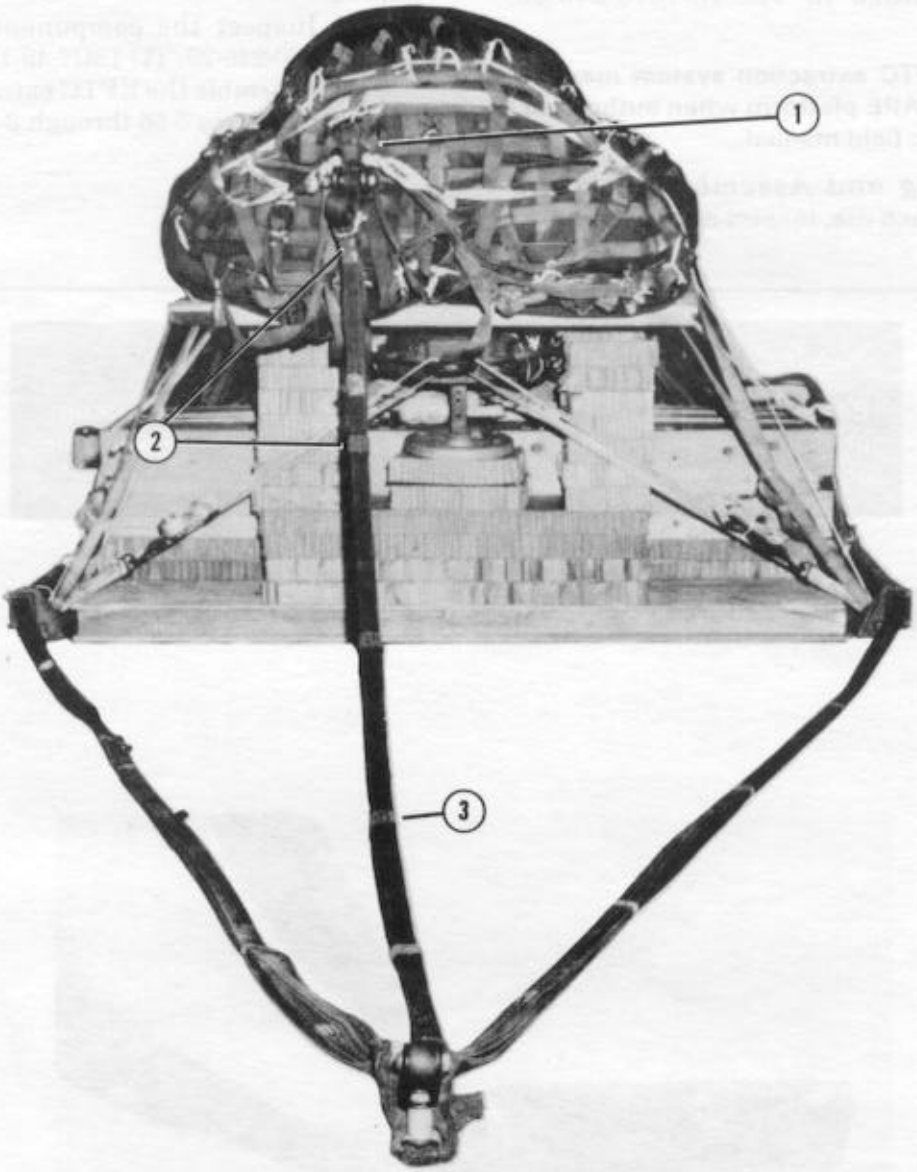
b. Allow the arm to turn down and toward the rear through the indents in the side rail.

c. Make sure the arm clears the indents by 1/4 inch.

(1) If the arm **CLEARS** the indents by 1/4 inch, return the arm to the cocked position and replace the safety pin.

(2) If the arm **FAILS** to clear the indents by 1/4 inch, make sure the correct mounting and clevis holes were used. If the correct holes were used **REPLACE** the actuator.

Figure 3-54. Actuator position verified



(1) Bolt the free end of the deployment line to the bridles of the cargo parachutes with a large suspension clevis.

Note: A single parachute uses a type IV link assembly.

(2) Extend the extraction bridle.

(3) Fold the excess deployment line and tie it in two places with one turn of type I, 1/4-inch cotton webbing. When the fold is of insufficient length, tie it in one place.

Figure 3-55. PEFTC extraction system installed

3-22. Extraction Force Transfer Coupling

Maintain the components of the EFTC extraction system as outlined in TM 10-1670-240-20/TO 13C7-49-11.

Note: The EFTC extraction system may be used on the LAPE platform when authorized by the specific field manual.

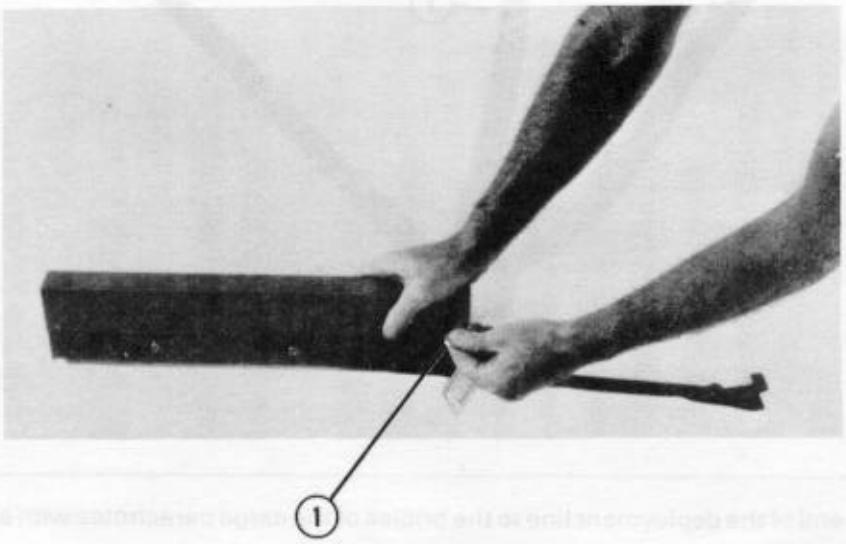
a. Inspecting and Assembling Components. Before each use, inspect and assemble the components of the EFTC extraction system as follows:

(1) Inspect the components according to TM 10-1670-240-20/TO 13C7-49-11.

(2) Assemble the EFTC extraction system as shown in Figures 3-56 through 3-60.

CAUTION

Be very careful when you cock the actuator because the compression rod spring will be under 175 pounds of pressure when the actuator is fully cocked.

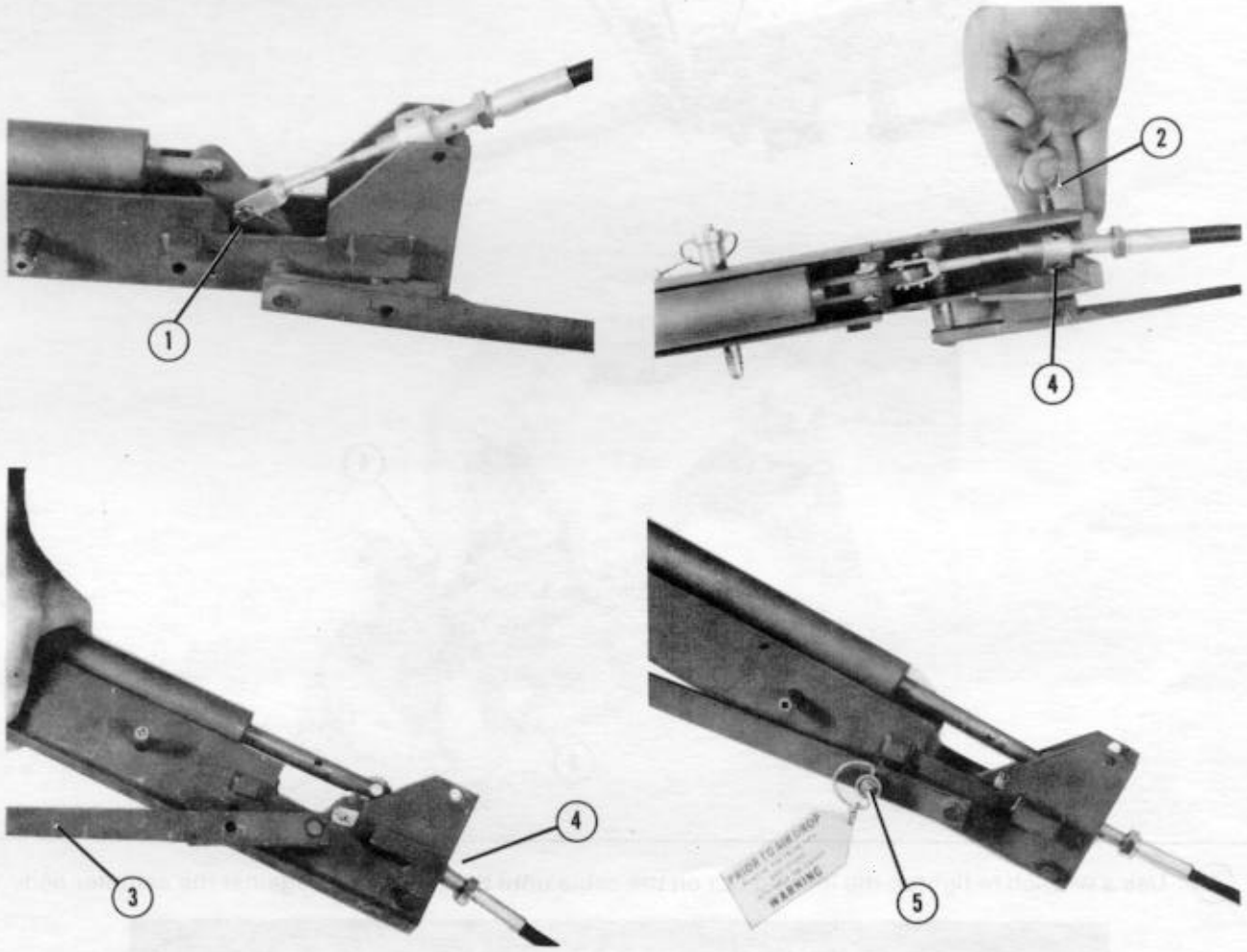


(1) Remove the locking pin, and rotate the cover upward and rearward.

Figure 3-56. Locking pin removed

CAUTION

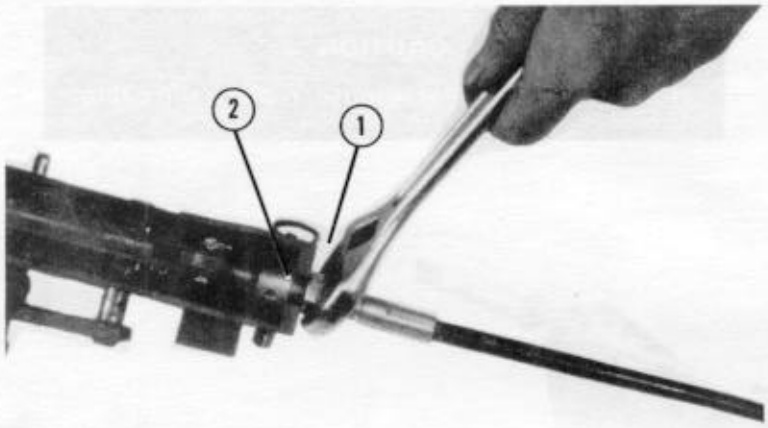
If the adjusting collar is loose, replace the cable.

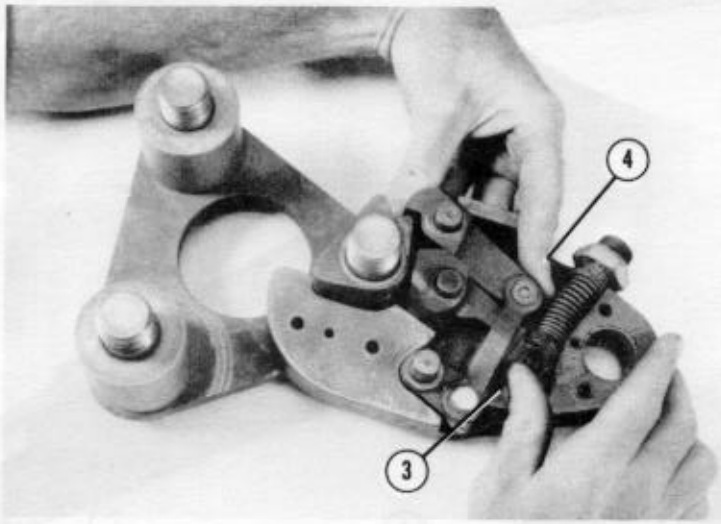


Note: Before attaching the clevis, make sure that the cable moves freely in the housing and that the cable is of the proper length for the load to be rigged. This length will be cited in the specific rigging manual.

1. Attach the clevis on the cable to the cable actuator with the straight pin and cotter pin.
2. Pull on the spring-loaded pin to release the actuator arm from the unlocked position.
3. Turn the actuator arm clockwise.
4. As the arm is turned, make sure that the adjusting collar on the cable fits inside the end slot of the actuator.
5. When the actuator is cocked, insert the locking pin to hold the actuator arm in place.

Figure 3-57. Cable installed and actuator armed





(1) Use a wrench to tighten the locking nut on the cable until the nut is flush against the actuator body.

CAUTION

DO NOT overtighten the locking nut. This may cause the housing to crack.

(2) Make sure that the adjusting collar is flush against the inside of the actuator body.

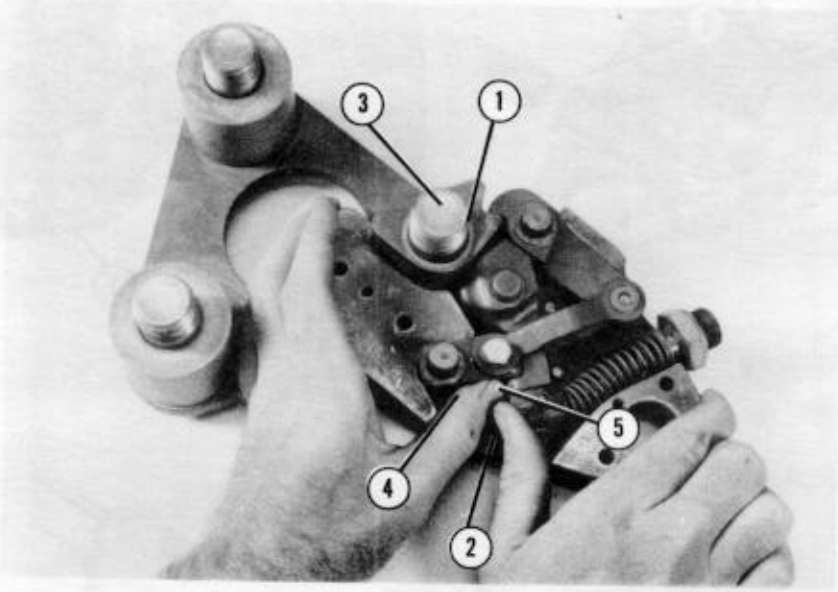
Note: To show the steps better, a side plate of the link and latch assembly has been removed.

To ensure that the cam of the link assembly is properly seated in the latch assembly with the retainer hook holding the cam, release and then reseat the cam as follows:

(3) Push up on the catch.

(4) Push down on the retainer hook and idler link to free the cam, and remove the link assembly.

Figure 3-58. Cable installed and the link assembly cam seated

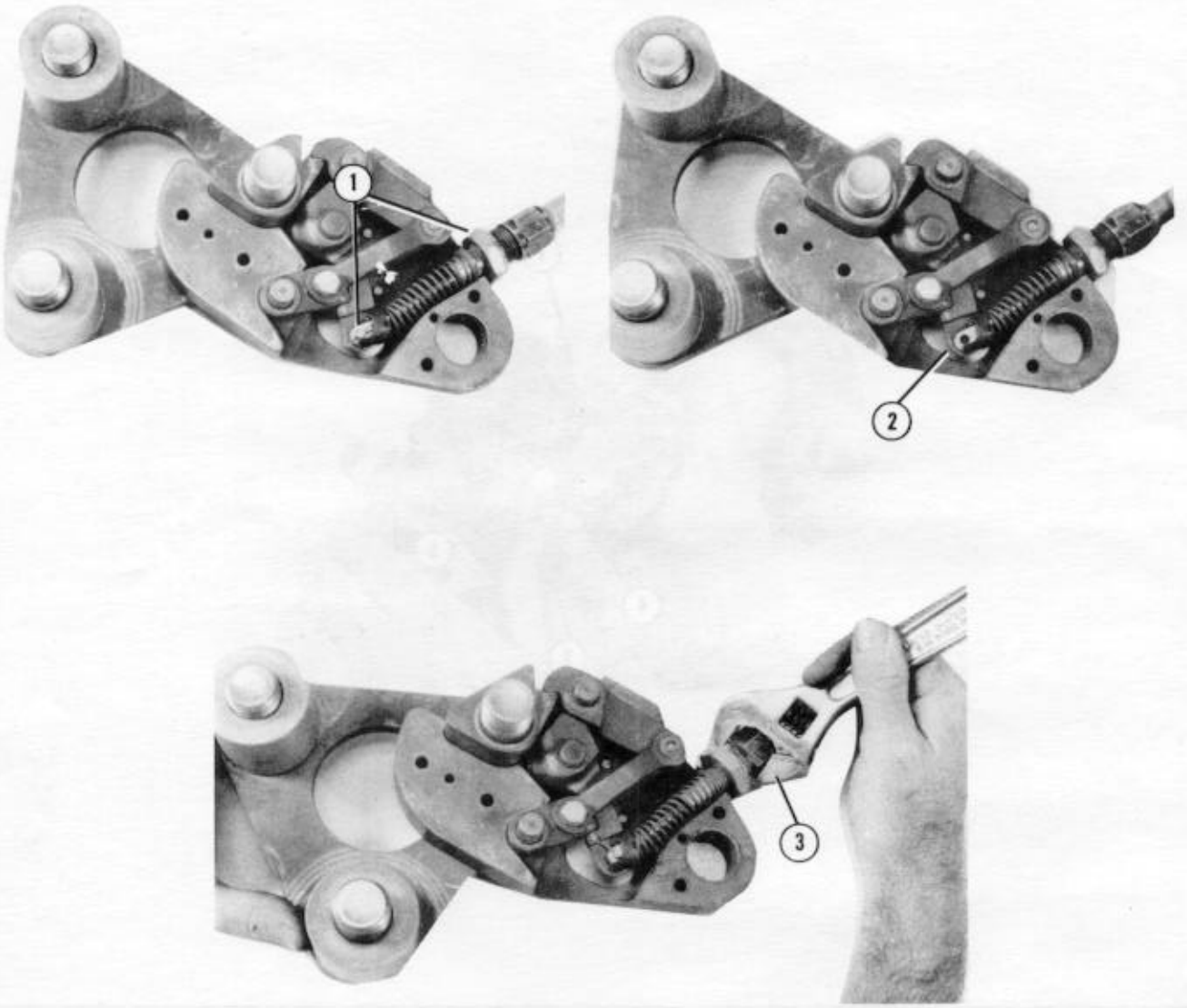


Reseat the cam of the link assembly in the latch assembly as follows:

1. Set the edge of the cam in place within the latch.
2. Repeat steps 3 and 4, Figure 3-58.
3. Push cam into place.
4. Push the lock link up to engage the retainer hook.
5. Align the dot on the lock link with the arrow on the catch.

The cam of the link assembly is now properly seated under the retainer hook of the latch assembly.

Figure 3-59. Link assembly cam reseated



(1) Make sure that the swage fitting end of the release cable is open 1/8 inch, and slide the fitting through the locking nut and catch spring down over the catch.

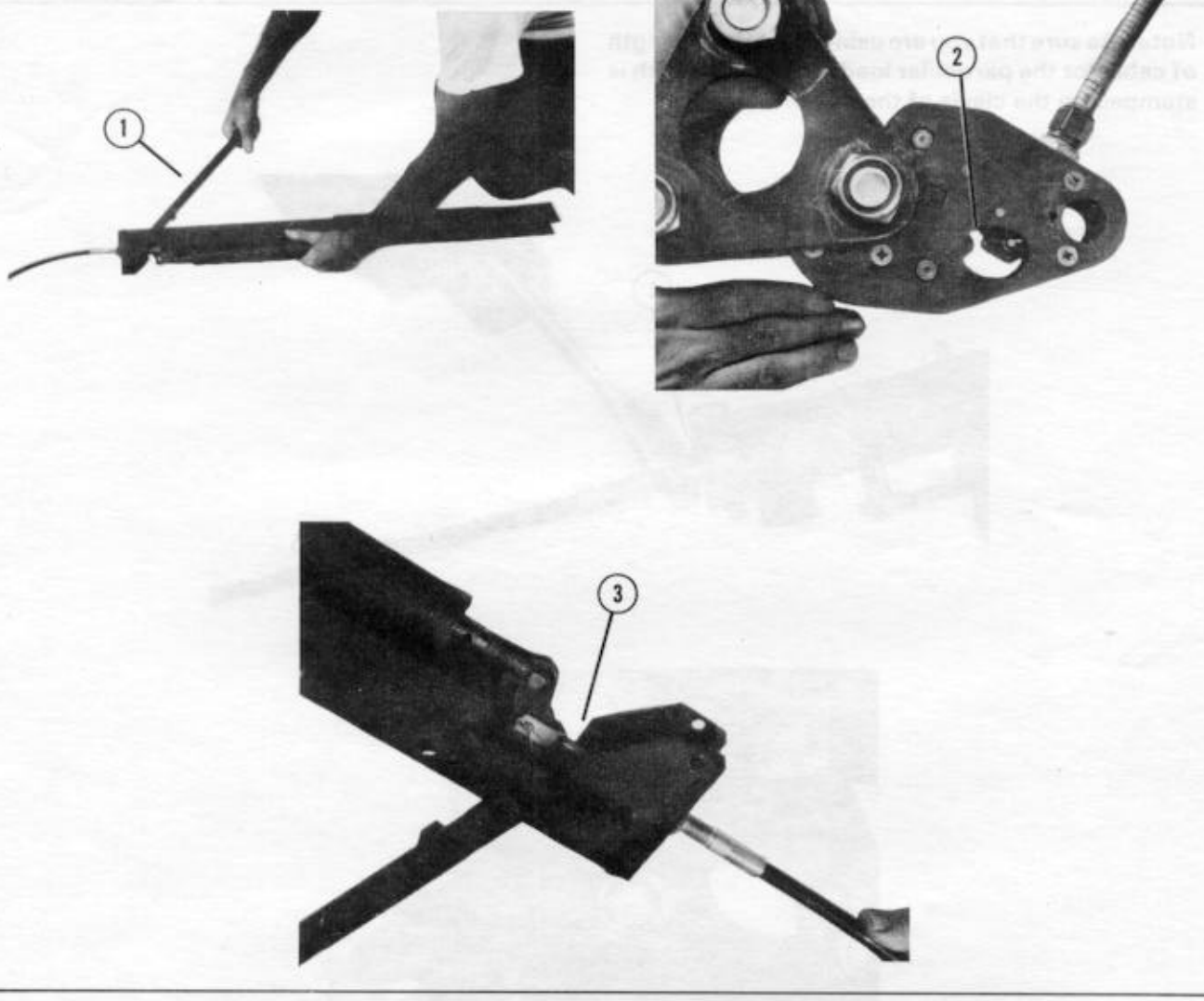
Note: Do not tamper with this factory-adjusted nut.

(2) Align the holes in the fitting with the hole in the catch, and insert the straight pin through the fitting. Catch and hold the pin in place with a cotter pin.

(3) Use a wrench to tighten the locking nut on the cable to the threaded fitting on the latch assembly.

Figure 3-60. Latch assembly cable adjusted

b. Testing EFTC Extraction System. Before each use of the EFTC extraction system, test it as shown in Figure 3-61.



Note: It takes two people to test the EFTC extraction system properly.

(1) The first person holds the actuator arm firmly and relaxes the binding on the locking pin. The second person removes the locking pin. The first person then allows the arm to travel to the released position.

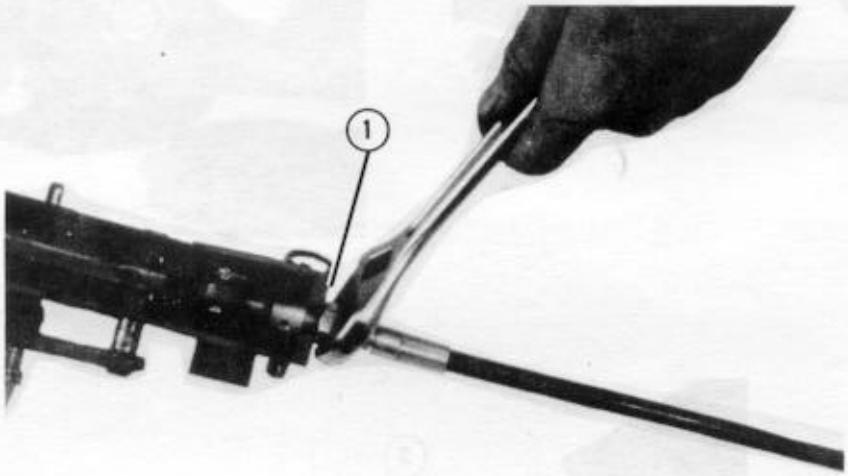
(2) The first person carefully rotates the arm fully to the lock-up position on the side of the actuator. The second person watches the inside of the latch assembly to be sure that the cable fully retracts the catch and that the locking link and retainer hook are released.

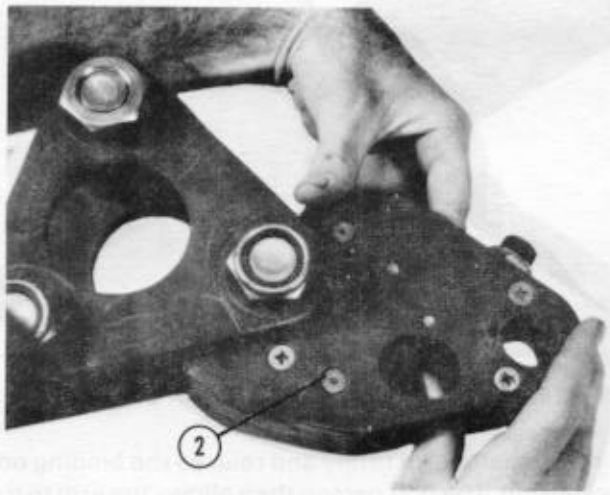
(3) The first person closely watches the cable inside the actuator to be sure that the pull on the cable is a straight pull and that the cable does not bend or crimp.

Figure 3-61. EFTC extraction system tested

c. Preparing and Attaching EFTC Extraction System for the Type II Platform. After the EFTC extraction system has been tested, disassemble it. Prepare and attach the EFTC extraction system as shown in Figures 3-62 through 3-66.

Note: Be sure that you are using the correct length of cable for the particular load. The cable length is stamped on the clevis of the cable.





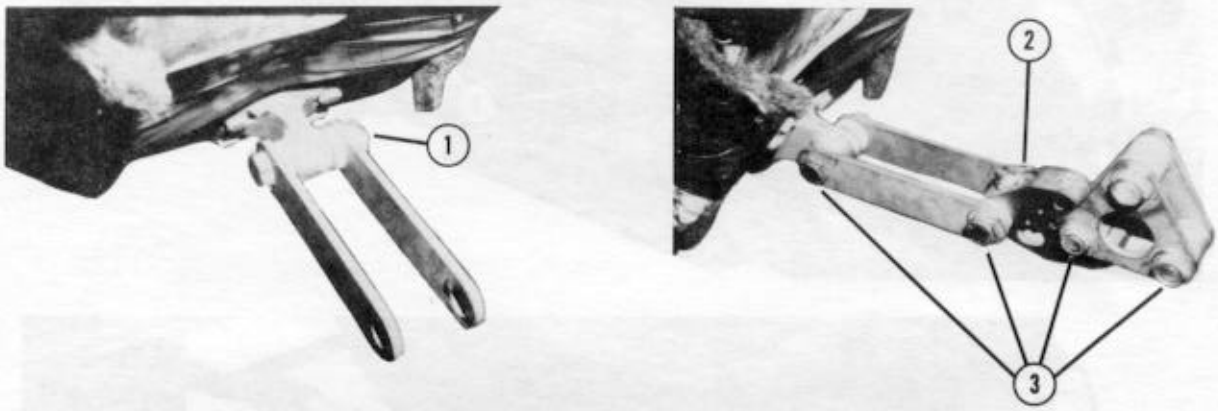
(1) Repeat steps 1 through 5, Figure 3-57, and steps 1 and 2, Figure 3-58, to attach the cable to the actuator.

(2) Repeat steps 3 and 4, Figure 3-58, and steps 1 through 5, Figure 3-59, to attach the link assembly to the latch assembly.

Figure 3-62. EFTC extraction system prepared

CAUTIONS

1. **Use a wrench to tighten all nuts. Make sure the nuts are tight enough to keep them from loosening during transport and airdrop.**
2. **Do not tighten the nut on the bolt of the link assembly cam so tight that the link cannot move.**



Note: The attaching point and the direction for facing the locking nut hole in the latch assembly will be given in the specific rigging manual.

(1) Bolt one end of the latch assembly adapter to the attaching point on the load. Tighten the nut firmly against the adapter.

Note: Use spacers as needed.

If the attaching point is a towing pintle, insert safety pin and tie the pintle closed with a length of type III nylon cord. Run the tie two times around the pintle. See steps 3 and 4, Figure 3-78, for the safetying of the towing pintle.

(2) Bolt the latch assembly to the adapter. Tighten the nut firmly against the adapter. The locking nut hole may face up (as shown), down, or toward the left side of the platform.

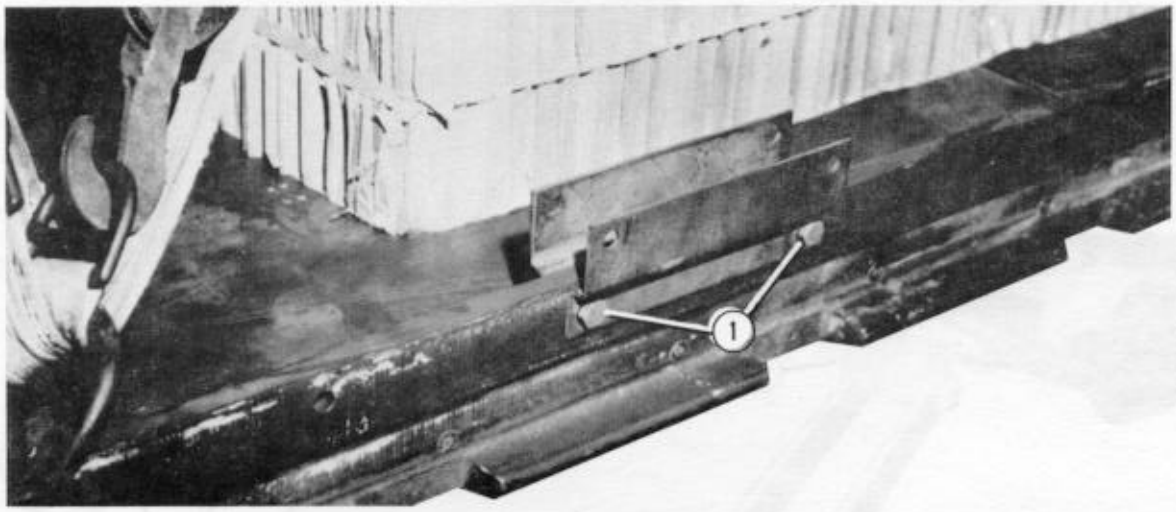
Note: Use spacers as needed.

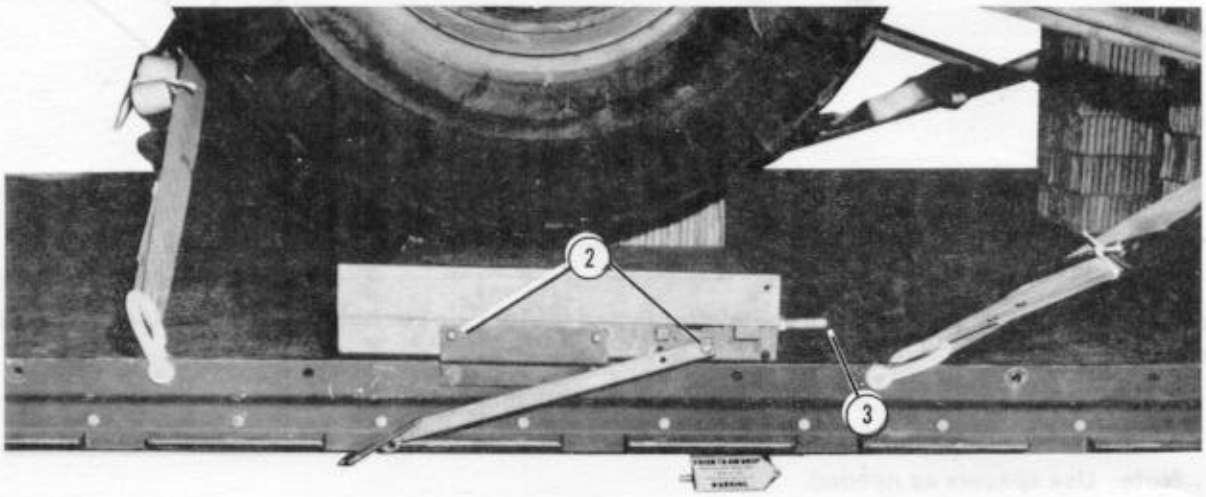
(3) Make sure that the bolts in the latch adapter and latch assembly and the bolt through the lower spacers in the link assembly are in a straight line.

Figure 3-63. Latch assembly attached

CAUTION

Tie the slack in the cable in a smooth S-shape bend. This should be tied to the side of the load or a lashing on the type II platform. This will avoid binding problems in the cable.





Note: The clevis holes to be used for bolting the bracket to the rail and the location of the safety ties for the cable will be given in the specific rigging manual.

(1) Bolt the actuator bracket to the left rail. Use a wrench to tighten the nuts firmly against the bracket.

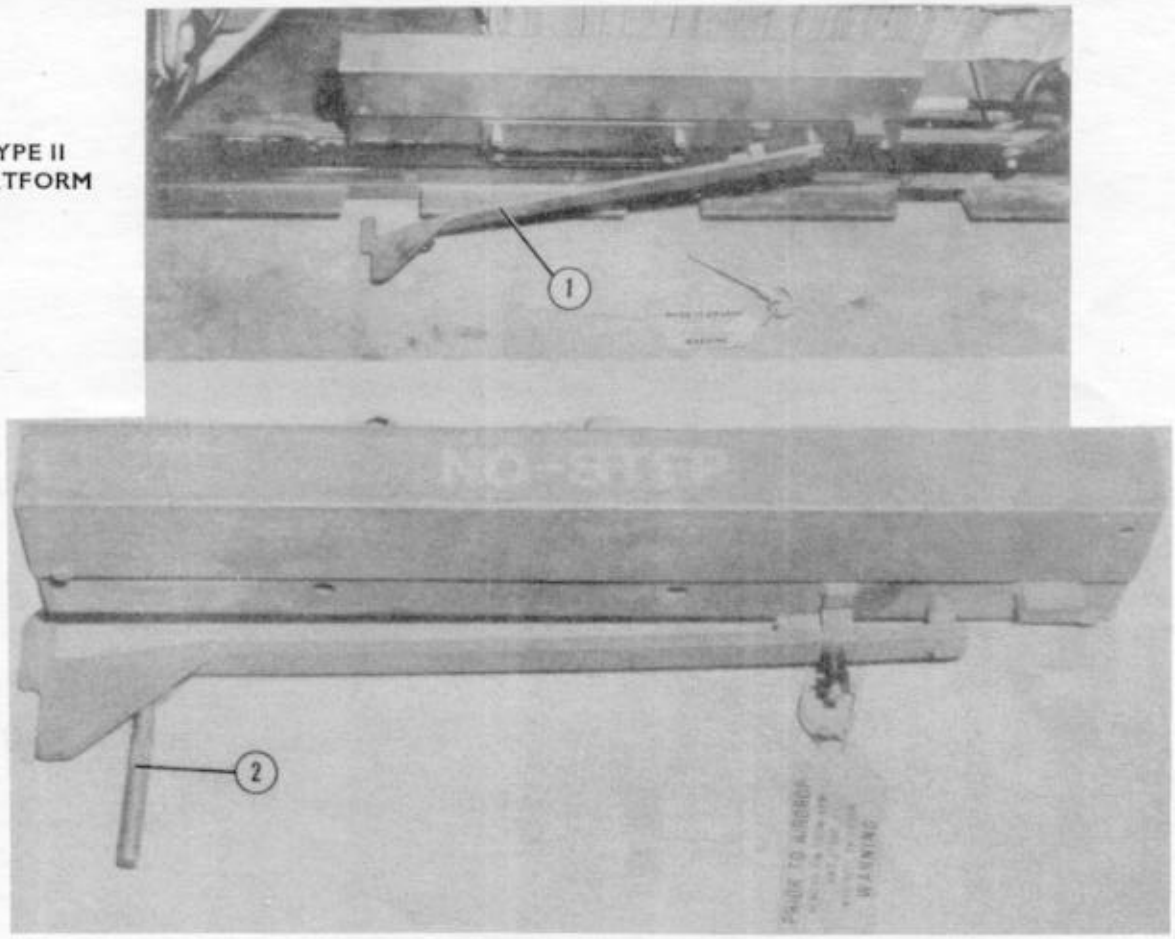
(2) Pin the actuator to the bracket with the two quick-release pins. Make sure the pins are put in from the inside of the bracket.

(3) Attach the cable to the cable actuator to prevent movement of the cable. Tie the cable to the load (inside of the side rail lashings) with type I, 1/4-inch cotton webbing.

Figure 3-64. Actuator attached

CAUTION
There MUST be a 1/4-inch clearance between the actuator arm and the platform indent.

TYPE II PLATFORM



TYPE V PLATFORM(for C-5 airdrop only)

(1) Verify the positioning of every installed actuator as follows:

a. Hold the actuator arm in place, and remove the locking pin.

b. Allow the arm to turn down through the forward indent in the side rail.

c. Make sure the arm clears the indent by 1/4 inch.

(1) If the arm CLEARS the indent by 1/4 inch, return the arm to the cocked position and replace the safety pin.

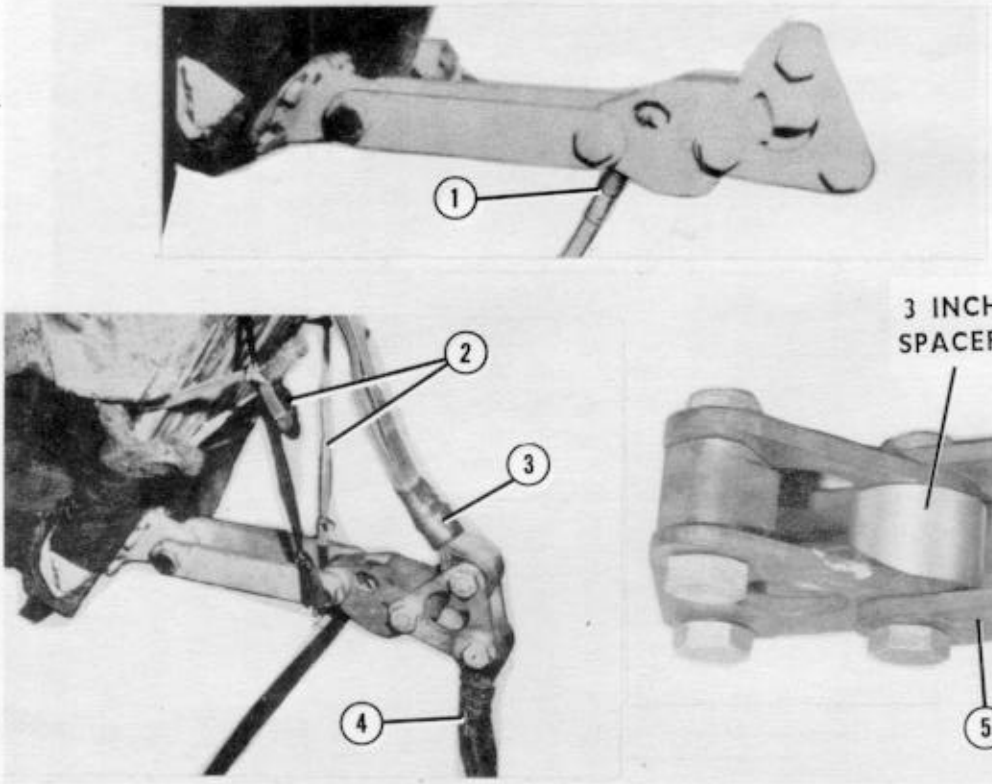
(2) If the arm FAILS to clear the indent by 1/4 inch, make sure the correct mounting and clevis holes were used. If the correct holes were used, REPLACE the actuator.

Note: After you verify the position of the actuator, remove the quick-release pins. Lay the actuator on the platform, and secure the actuator. This will keep the actuator from being damaged while the load is being loaded in the aircraft.

(2) If the type V platform is to be airdropped from a C-5 aircraft, install an actuator arm extension pin on the actuator arm.

Figure 3-65. Actuator position verified

Note: The length and size of the deployment and extraction lines will be given in the specific rigging manual.



(1) See Figure 3-60 to attach and adjust the cable to the latch assembly.

(2) Tie the latch assembly to the load with two lengths of 1/2-inch tubular nylon webbing.

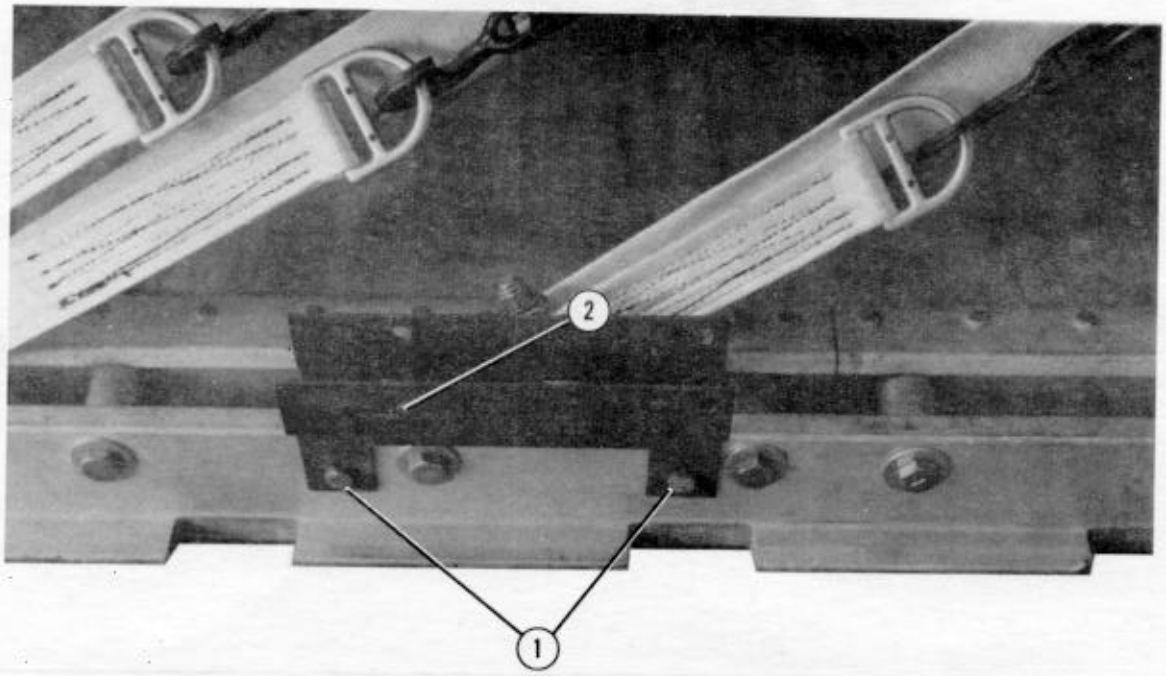
(3) Bolt one end of the deployment line to the top spacer of the link assembly.

(4) Bolt one end of the extraction line to the lower spacer of the link assembly.

(5) When a 5- or 6-loop extraction line is used, the link assembly MUST be used to separate the loops of the line.

Figure 3-66. Cable, deployment line, and extraction line bolted to latch assembly

d. Preparing and Attaching EFTC Extraction System for the Type V Platform. After the EFTC extraction system has been tested, disassemble it. Prepare the EFTC extraction system components and attach them to the type V platform as shown in Figures 3-67 through 3-69.



Note: Bolt the mounting brackets to the bracket holes as directed in the specific rigging manual.

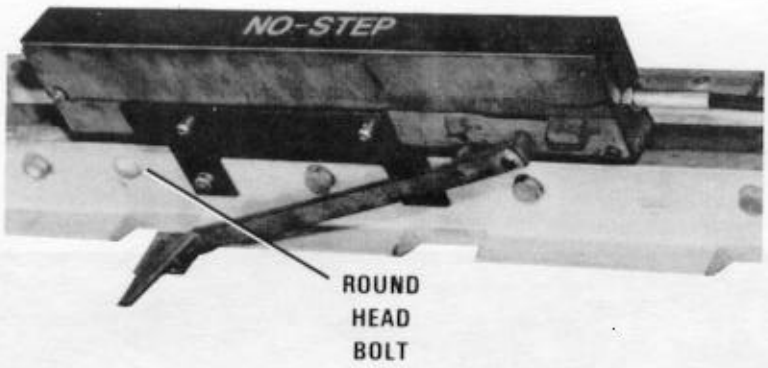
(1) Bolt the inside and outside actuator brackets to the left rail of the type V platform.

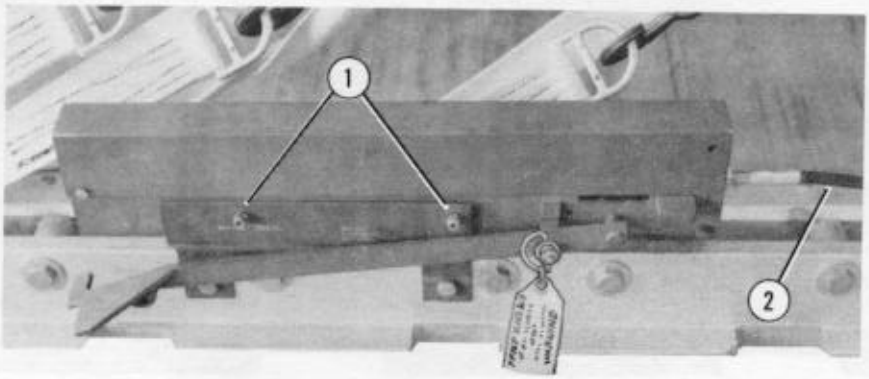
(2) Make sure the arrow stamped on the outside bracket points toward the front of the platform to show the brackets are properly installed.

Figure 3-67. Actuator brackets installed on the type V platform rail

CAUTION

When the actuator arm falls directly over the rail bolt, use a round head replacement bolt (NSN 5306-00-337-2996).





(1) Pin the actuator to the brackets with the pins provided. Make sure the pins are put in from the inside of the bracket.

(2) Pass the cable to the inside of the side rail lashings to prevent movement of the cable. Tie the cable in place as directed by the specific rigging manual.

CAUTION

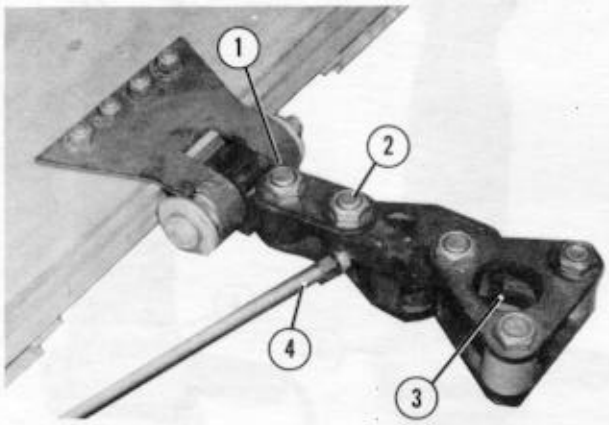
The modified extraction lugs are identified by the presence of a 1/2-inch steel strip welded to the lower front flat surface of the extraction lug.

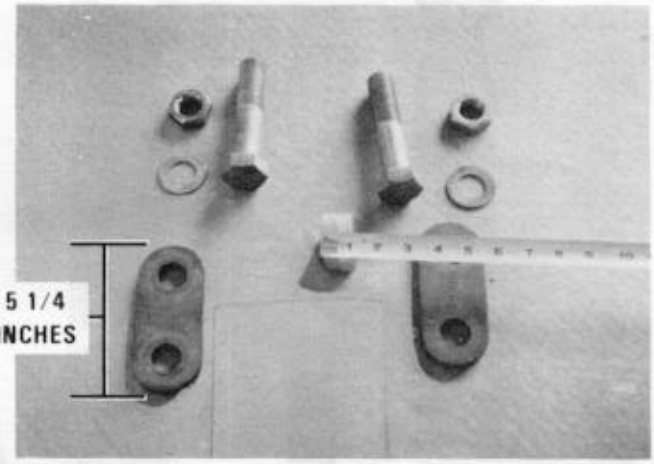
(3) Refer to Figure 3-65 to verify actuator position.

Figure 3-68. Actuator pinned to brackets

CAUTION

Tie the slack in the cable in a smooth S-shape bend. This should be tied to the side of the load or a lashing on the type V platform. This will avoid binding problems in the cable.





(1) Bolt one end of a 5 1/4-inch, hardened steel link adapter (measured from end to end) to the platform extraction bracket between the extraction bracket and the top plate of the link adapter.

(2) Bolt the latch assembly to the link adapter between the bottom plate of the link adapter and the latch assembly.

Note: This raises the latch assembly up to prevent damage to the aircraft.

(3) Follow steps 3 and 4, Figure 3-58, and steps 1 through 5, Figure 3-59, to attach the link assembly to the latch assembly.

(4) Follow steps 1, 2, and 3, Figure 3-60, to attach the cable assembly to the latch assembly.

(5) Bolt the deployment line to the right spacer and extraction lines to the left spacer of the link assembly according to steps 4 and 5, Figure 3-66 (not shown).

(6) Make sure that the bolts in the link adapter and latch assembly and the bolts through the left spacers in the link assembly are in a straight line. They should be wrench tight.

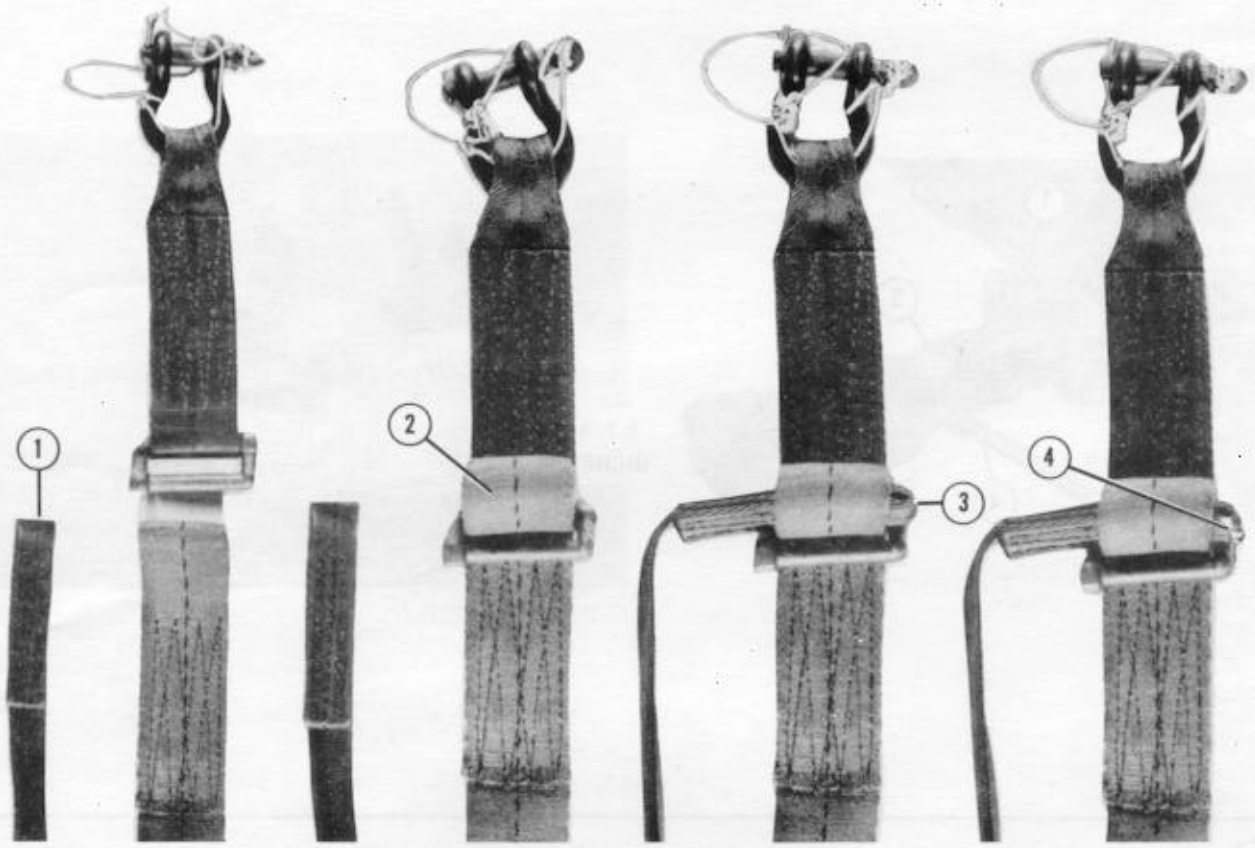
Figure 3-69. Latch assembly bolted to type V platform extraction bracket

3-23. Static Line/Connector Strap Extraction System

Inspect and maintain the components of the SL/CS extraction system as outlined in TM 10-1670-240-20/TO 13C7-49-11. Assemble and attach the system as described below.

a. Assembling Components.

(1) Tie the release line to the connector link as shown in Figure 3-70 before assembling the components of the SL/CS extraction system.



(1) Look at the entire length of the release line. Pull the line from its sleeve at the upper end until you can see the white stitching to the center of the line. Repeat for the other end of the release line. Lay out the static line assembly with the release line facing up.

Note: Be sure that the release line is not twisted and that the seam is down. Pull the release line until the white stitching is within 1 inch of the upper static line sleeve.

(2) Pass the top loop in the static line up through the connector link on the connector web.

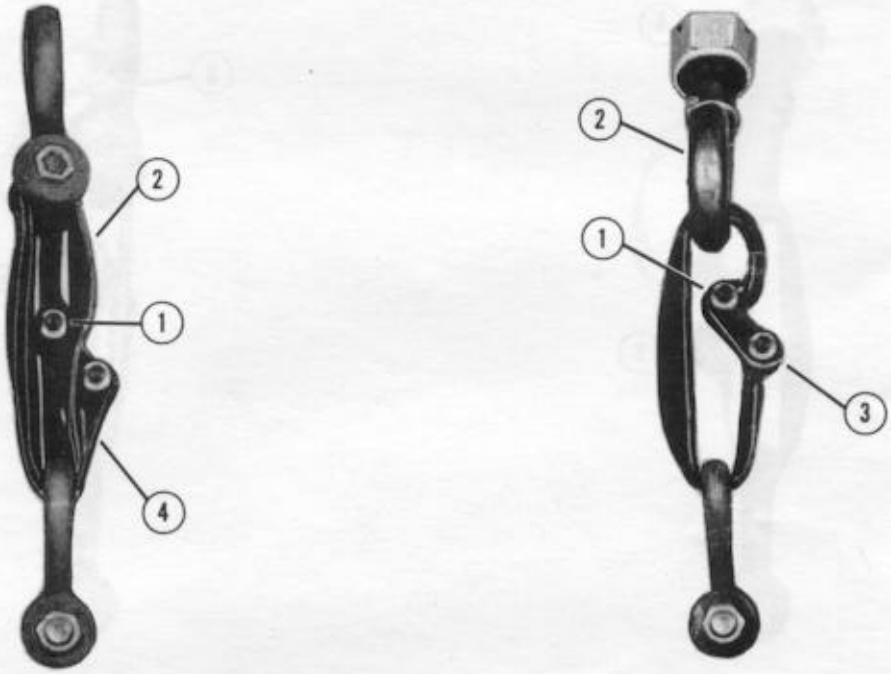
(3) Run the end loop of the release line, with the folds facing up, through the loop in the static line.

Note: For the left static line, run the release line through the loop from the opposite direction. The release line runs from inboard to outboard through the static line loop.

(4) Tie the loop in the end of the release line to the connector link with a single length of ticket number 5 or 8/7 cotton thread.

Figure 3-70. Release line tied to connector link

(2) Assemble the components of the SL/CS extraction system as shown in Figures 3-71 through 3-77.



Note: Use a spool or buffer or tape the bolt of the attachment clevis to prevent contact of the connector strap with the exposed threads.

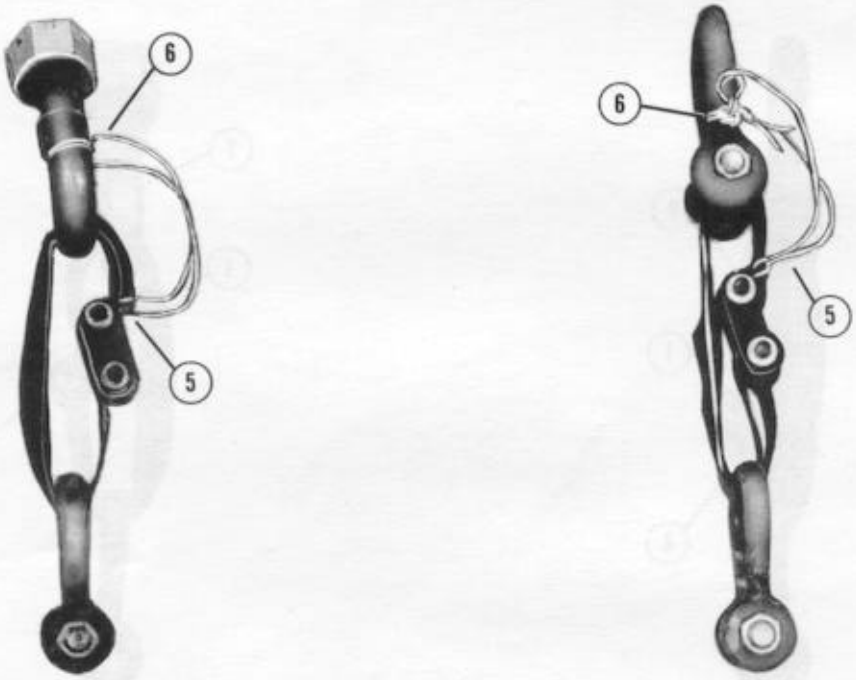
(1) Place the end loop of a 60- or 120-inch connector strap on the sleeve of a type IV link assembly. The 60-inch connector strap is used with the 15-foot extraction parachute. The 120-inch connector strap is used with the 22-and 28-foot, light-duty extraction parachute.

(2) Run the free end of the strap up through the lunette or attaching point clevis, down through the extraction clevis, up through the link, back up through the lunette or attaching point clevis, and down through the extraction clevis. Place the free end loop of the connector strap on the remaining sleeve of the link.

(3) Run a 60-inch strap through the clevises two times and through the link one time.

(4) Run a 120-inch strap through the clevises four times and through the link three times.

Figure 3-71. Connector strap installed



(5) Fold a 60-inch piece of type III nylon cord in half lengthwise, and run the folded end through the loop in the connector strap nearest the attaching point clevis or lunette. Run the free ends of the cord through the loop, and pull the cord taut.

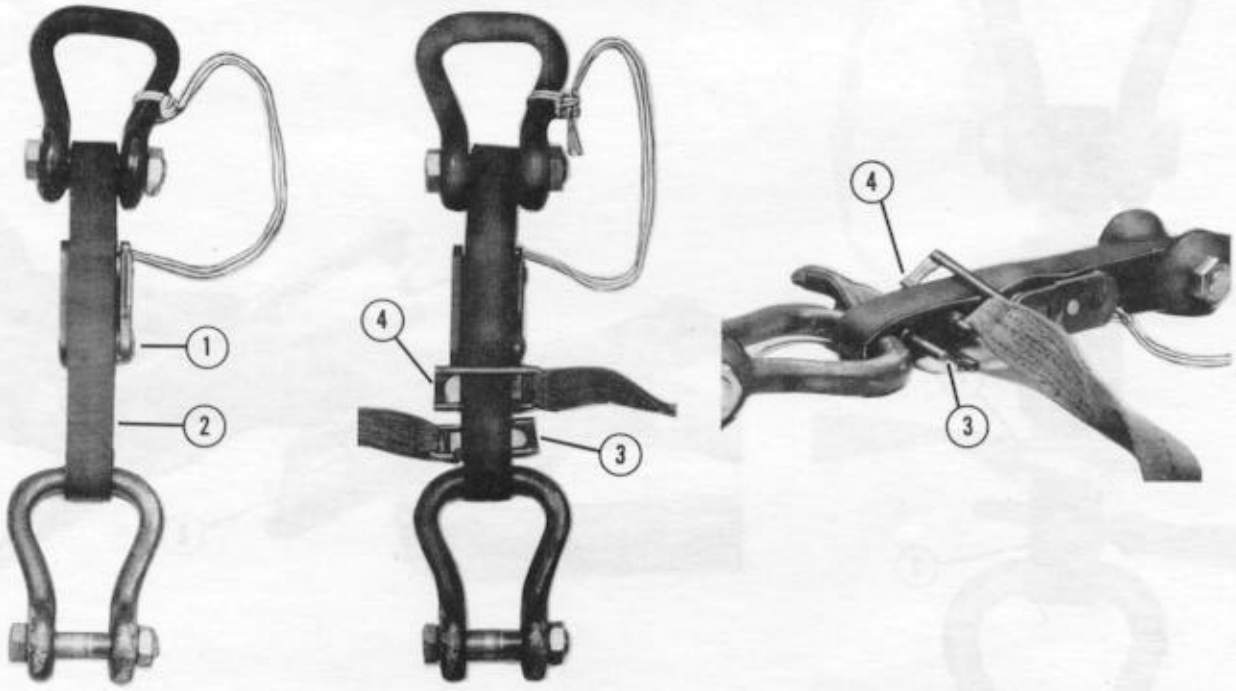
Note: This tie MUST NOT encircle any of the plies of the connector strap.

(6) Tie the free ends of the nylon cord to the right arm of the attaching point clevis or the right side of the lunette with three alternating half hitches and with an overhand knot in each running end.

Figure 3-71. Connector strap installed (continued)

CAUTION

Be sure that the side link cover lock closes toward the attaching point clevis and that the button is properly seated.



Note: In Figures 3-72 through 3-77, an attaching point clevis and a 60-inch connector strap are used.

(1) Put the side link plate on the type IV link assembly, and close the side link cover lock toward the attaching point clevis until the spring has properly seated the button.

(2) Even all plies of the connector strap to form a connector strap loop.

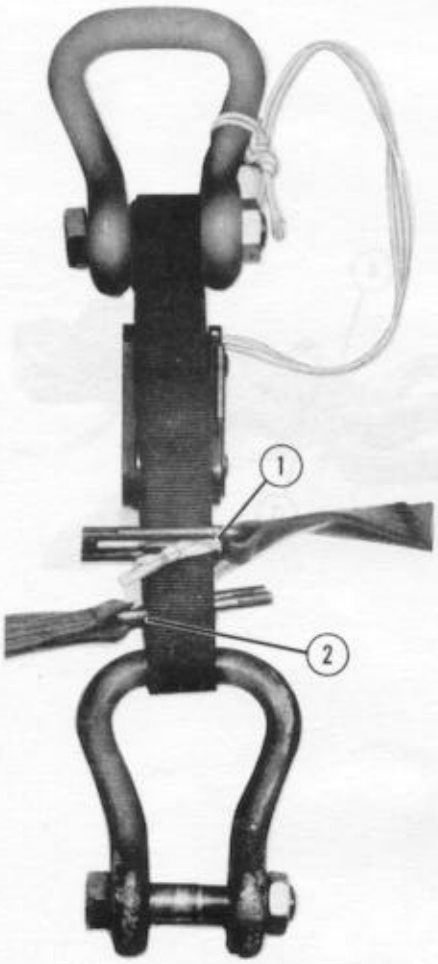
(3) Fit the guillotine knife of the left static line around all the bottom plies of the connector strap loop (two plies for a 60-inch strap and four plies for a 120-inch strap). Place the knife between the link and the extraction clevis with the ferrule up.

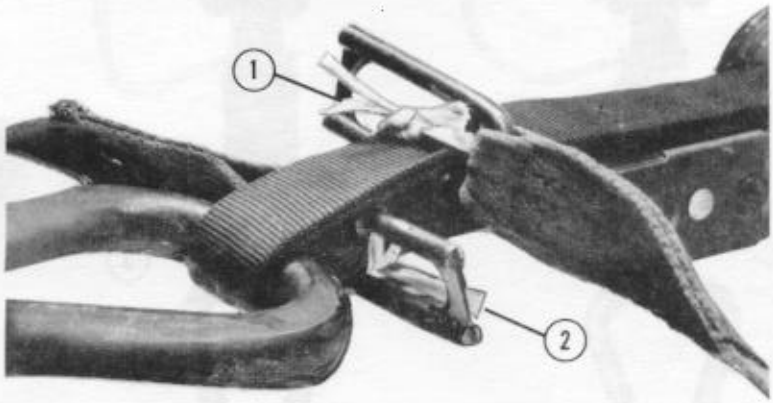
(4) Fit the knife of the right static line around the top plies of the connector strap loop as in step 3 above. Place the knife between the first knife and the link with the ferrule down.

Figure 3-72. Guillotine knives fitted

CAUTION

Follow every step shown EXACTLY when safetying and attaching this extraction system.





(1) Fold a length of type I, 1/4-inch cotton webbing lengthwise, and run the folded part through the aperture of the right knife. Run the webbing over the plies and around the bar of the knife. Tie the ends of the webbing together with a surgeon's knot and a locking knot.

(2) Tie the left knife to the connector strap loop as in step 1 above, but with the webbing running under the bottom plies and the knot on the bottom of the strap loop.

Note: Make the knot for the right knife on top of the connector strap loop, and make the knot for the left knife on the bottom of the loop.

Figure 3-73. Right and left knife attached to connector strap

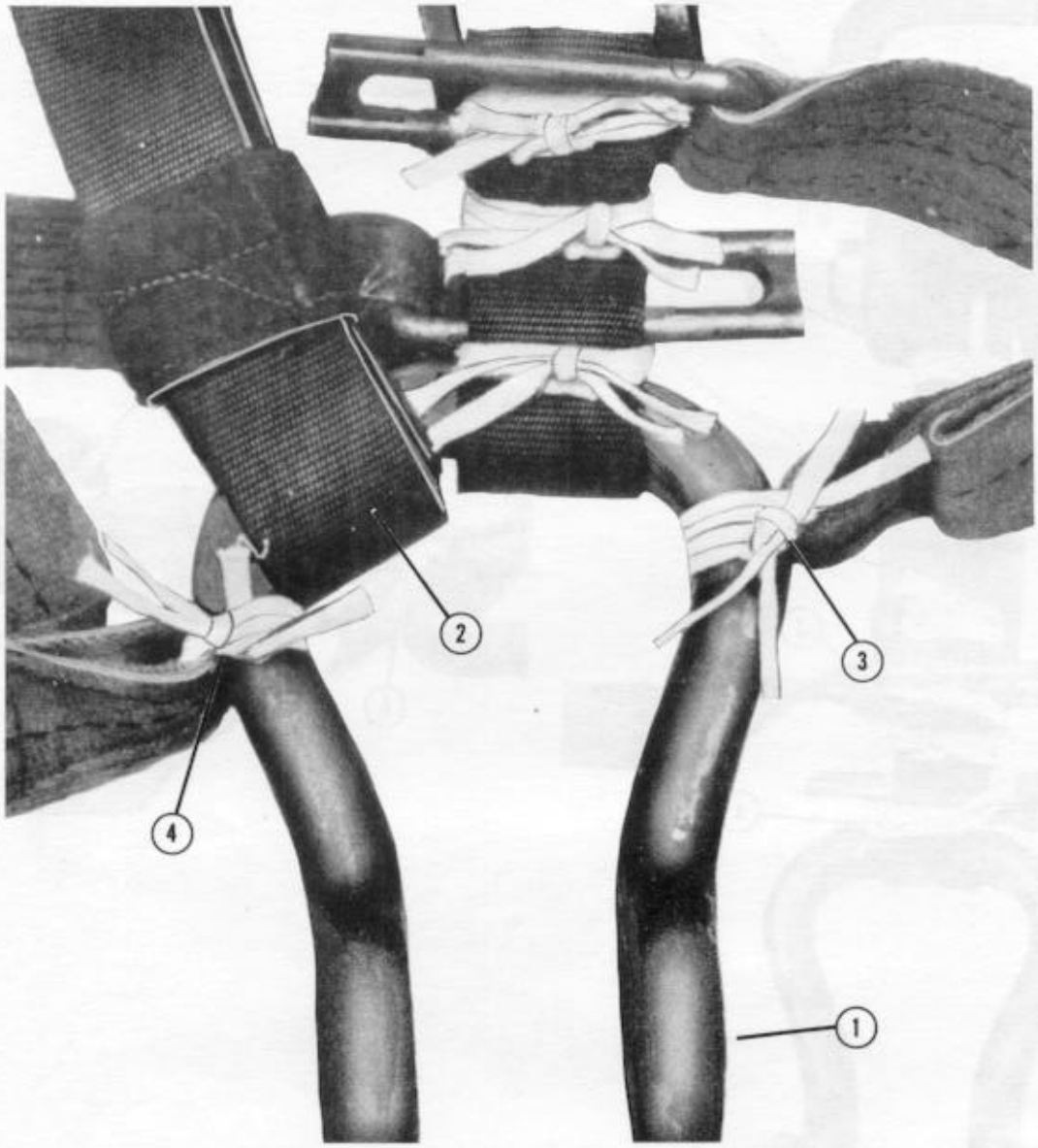
(1) Run two lengths of type I, 1/4-inch cotton webbing two times around all of the plies of the connector strap loop, and tie the ends of the webbing together with a surgeon's knot and a locking knot. Make the tie between the attaching point and the type IV link assembly.

(2) Make a second tie, as in step 1 above, between the link and the right knife.

(3) Make a third tie, as in step 1 above, between the two knives.

(4) Make a fourth tie, as in step 1 above, between the left knife and the extraction clevis.

Figure 3-74. Connector strap secured



(1) Remove the bolt from the extraction clevis.

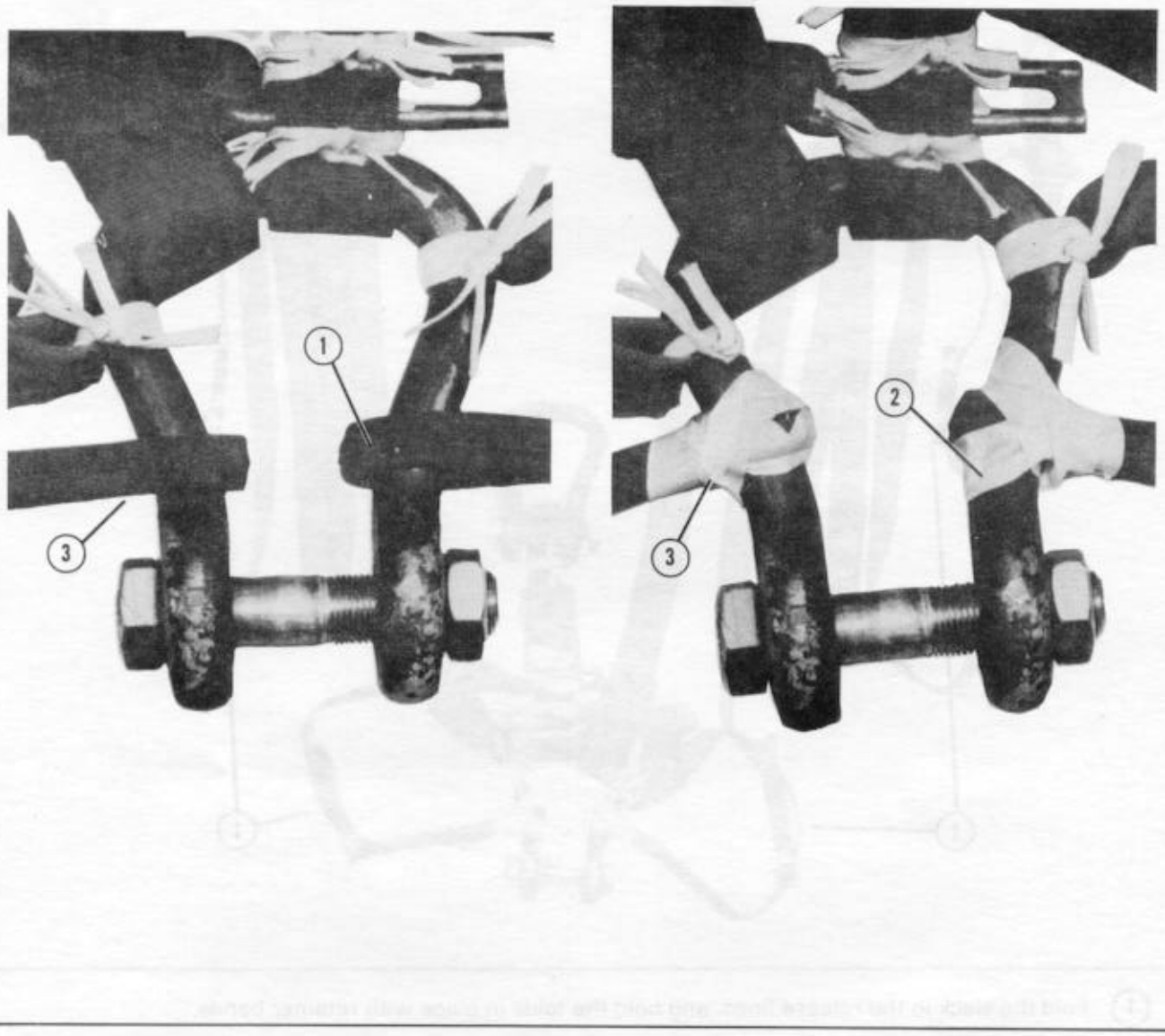
(2) After determining the length and size of the deployment line from the specific rigging manual, slide the loop in one end of the line onto the left arm of the extraction clevis.

(3) Run two lengths of type I, 1/4-inch cotton webbing two times through the breakcord loop of the right static line and around the right arm of the extraction clevis. Tie the ends of the webbing together with a surgeon's knot and a locking knot.

(4) Tie the breakcord loop of the left static line to the left arm of the clevis as in step 3 above.

Note: See Figure 3-77 for proper layout of static lines.

Figure 3-75. Deployment line installed



(1) Slide the large loop in the right release line of the right static line onto the right arm of the extraction clevis.

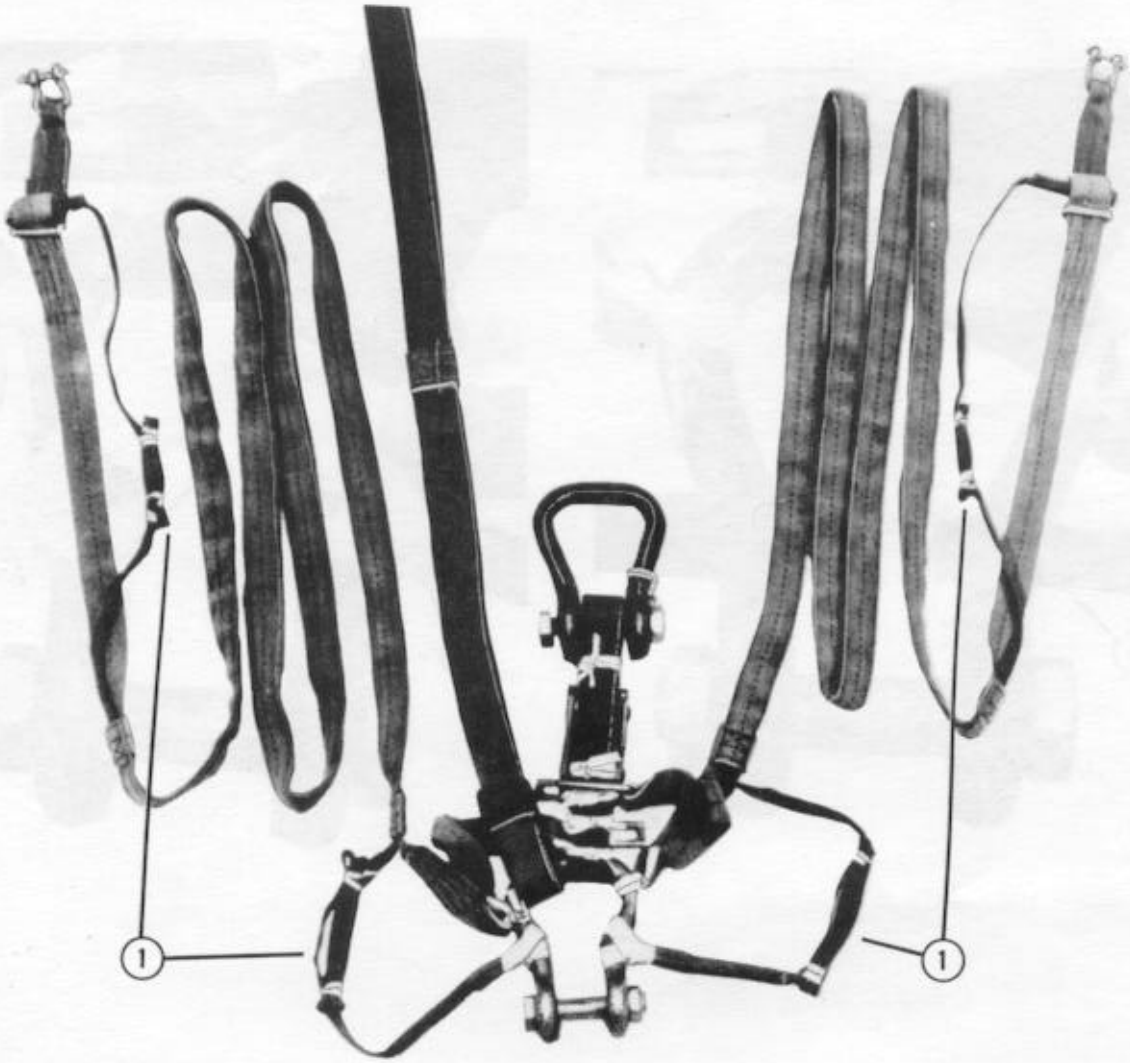
(2) Tape the loop to the clevis.

(3) Slide the loop of the left release line on the left arm of the clevis, and tape the loop to the clevis.

Figure 3-76. Right and left loop of the static line installed on the extraction clevis

CAUTION

Before you fold the slack in the release lines, make sure that the static lines and connector webs are straight and that the release lines pass through the connector webs from inboard to outboard.



(1) Fold the slack in the release lines, and hold the folds in place with retainer bands.

CAUTION

Be sure that enough slack is left in the release lines to allow the extraction force to pull on the static lines before the release lines.

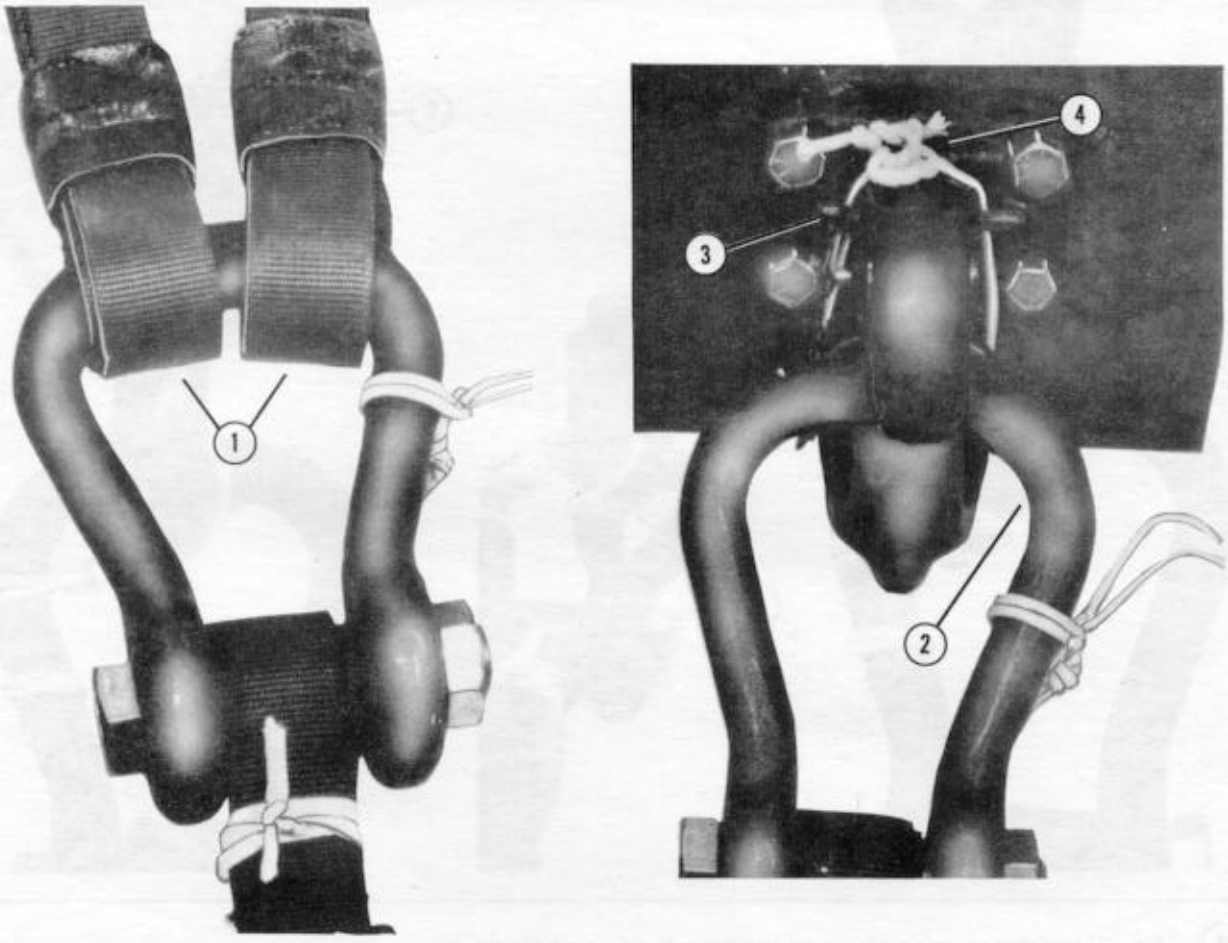
Figure 3-77. SL/CS extraction system assembled

b. Attaching SL/CS Extraction System.

(1) Attach the SL/CS extraction system to the drop item or to a pair of slings fitted to the drop item or bolted to the rearmost clevis hole in each side rail of the platform with a clevis as shown in Figure 3-78.

Note: Because the connector strap loop must extend past the cargo parachute, the primary attaching point may have to be extended. The specific rigging manual will show how to extend the primary attaching point by using slings.

(2) Attach the SL/CS extraction system to the towing pintle and safety the pintle closed as shown in Figure 3-78.



(1) Remove the bolt from the attaching point clevis, and pass the left arm of the clevis through both slings. Replace the bolt.

(2) Open the towing pintle and fit the attaching point clevis into the pintle. Close the pintle.

(3) Insert the safety pin into the pintle.

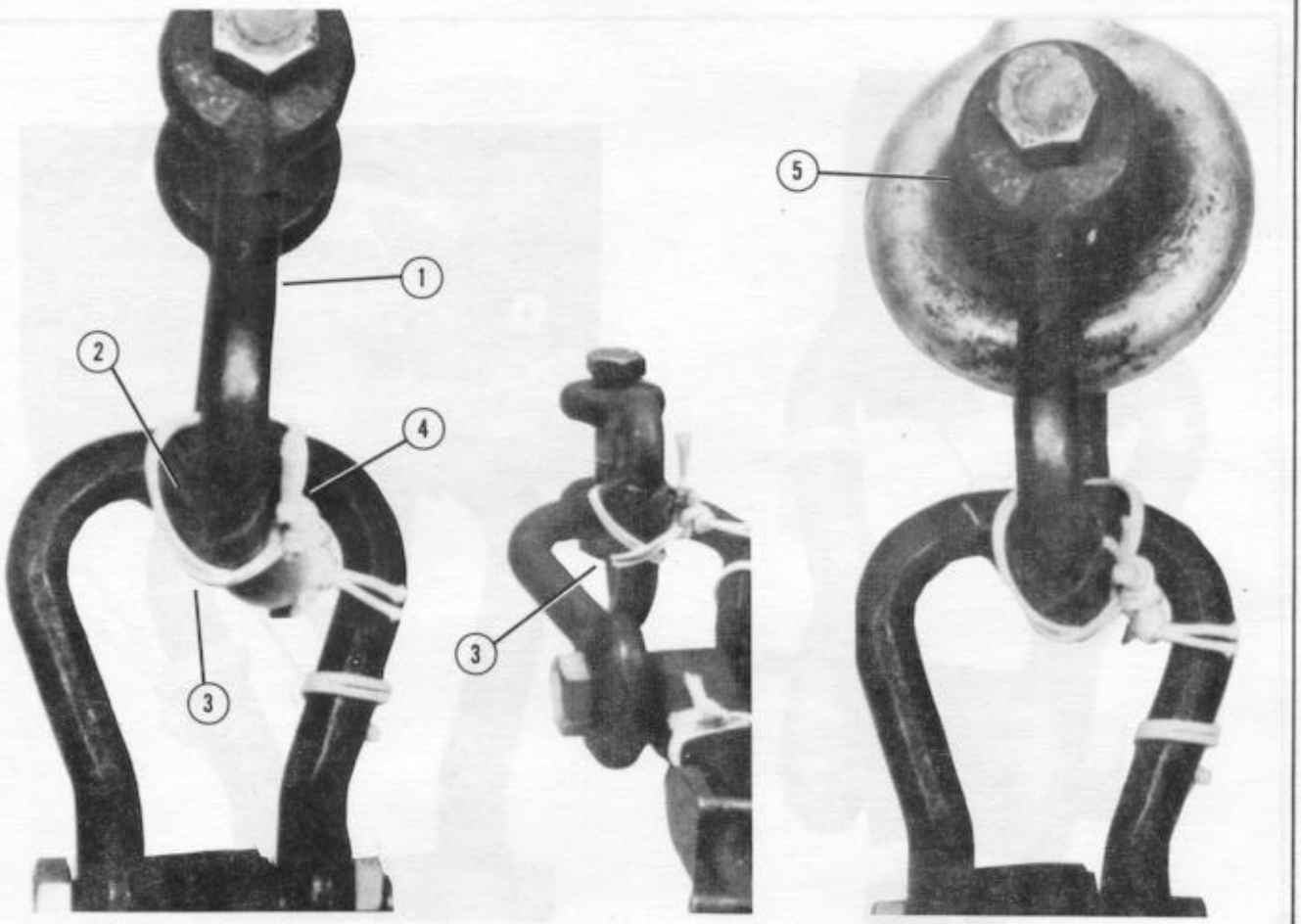
(4) Run a length of type III nylon cord two times around the pintle to the rear of the latch so that it cannot open. Tie the ends of the cord together with a surgeon's knot and a locking knot. Tie an overhand knot in each running end.

Figure 3-78. Extraction system fitted to a towing pintle or slings

(3) Assemble some SL/CSs in advance, and put them in stock. If the SL/CS extraction system is to be attached to the lunette, use an additional large clevis assembly. Tie this additional clevis to the attaching point clevis as shown in Figure 3-79. Bolt the system to the lunette of the drop item as shown in Figure 3-79.

CAUTION

The nuts should be tight enough to keep them from loosening during transport and airdrop.



(1) Fit a large suspension clevis to the attaching point clevis.

(2) Tape the clevises together.

(3) Tie the clevises together with two lengths of type III nylon cord. Cross the cord in front of and to the rear of the clevises.

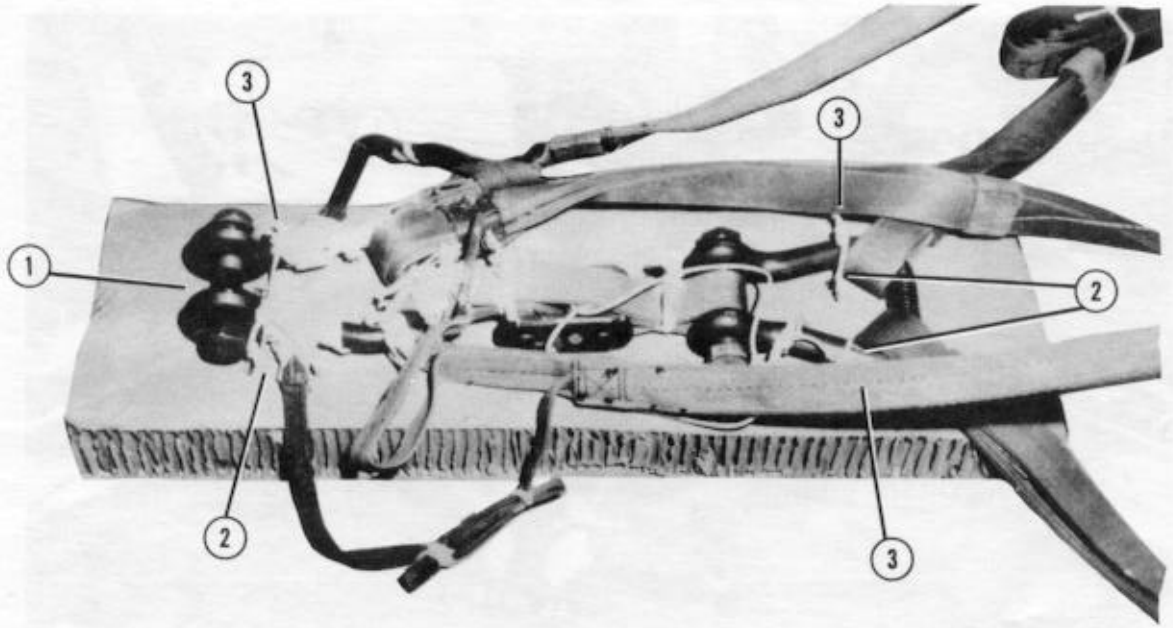
(4) Tie the ends of the nylon cord together with a surgeon's knot and a locking knot. Tie an overhand knot in each running end.

(5) Remove the bolt from the additional clevis, and fit the clevis around the lunette. Replace the bolt.

Note: Preassembled SL/CS extraction systems MUST use the correct length and size of deployment line and the correct connector strap.

Figure 3-79. Preassembled extraction system attached to a lunette

c. Padding SL/CS Extraction System. Pad the SL/CS extraction system with honeycomb or felt when it is used to extract a platform. Pad and tie the SL/CS extraction system as shown in Figure 3-80.



(1) Lay the SL/CS extraction system on a 12- by 34-inch piece of honeycomb or felt.

(2) Push holes through the honeycomb or felt to safety the clevis arms of both clevises to the honeycomb or felt.

(3) Use single lengths of type III nylon cord to safety the arms of both clevises to the honeycomb or felt.

Figure 3-80. SL/CS extraction system padded and tied

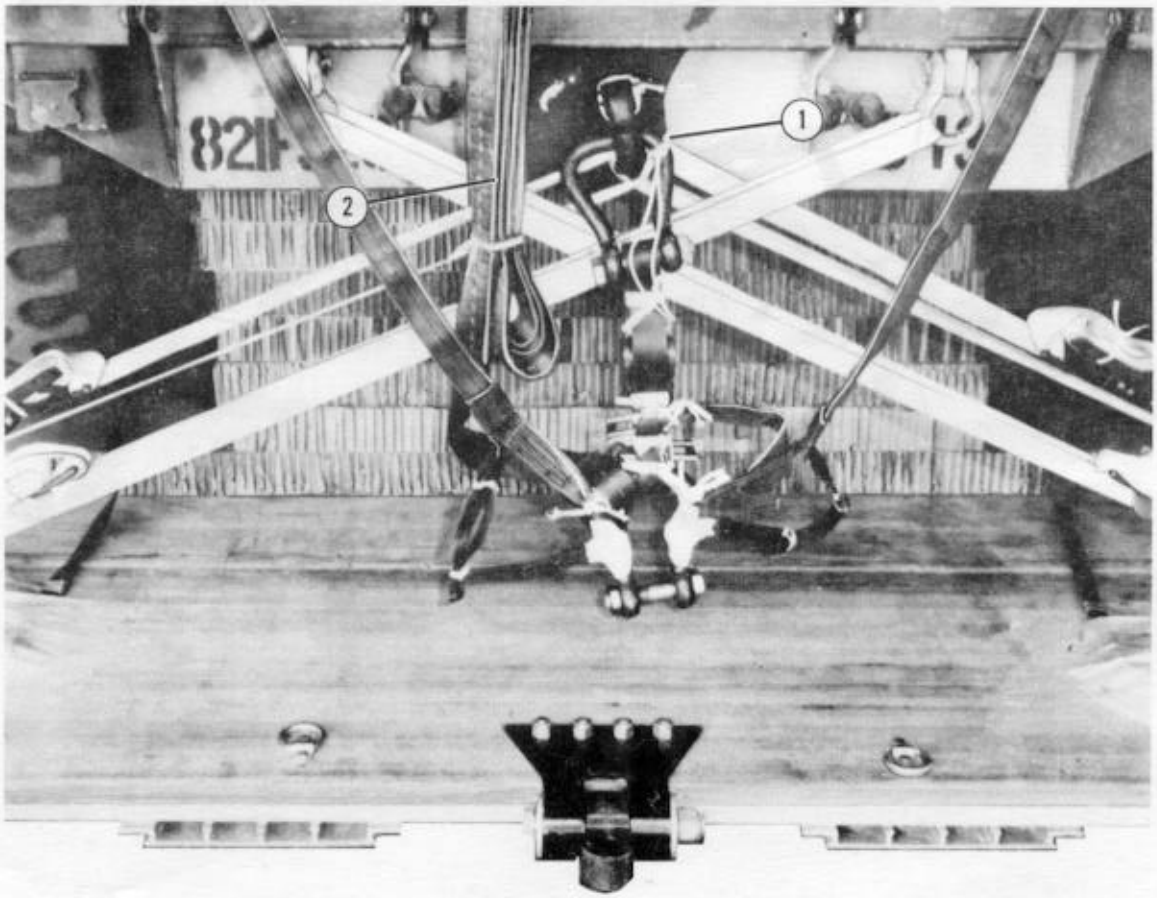
d. Attaching SL/CS Extraction System to Type V Platform Loads. Use the SL/CS extraction system on the type V platform only when existing stocks of EFTC are not available, are in use, or are reserved for contingency requirements. Select the method of extraction (item or platform) in accordance with the specific rigging manual. Attach the SL/CS extraction system to the type V platform as shown in Figures 3-81 and 3-82. Observe the following restrictions for the SL/CS extraction system.

(1) The weight restrictions for use of the SL/CS extraction system are 18,750 pounds for C-141 aircraft and 25,000 pounds for C-130 aircraft (item- or platform-suspended loads).

(2) The SL/CS extraction system must not be used with 8-foot, type V platforms.

(3) The SL/CS extraction system can continue to be mixed with the EFTC on the same aircraft.

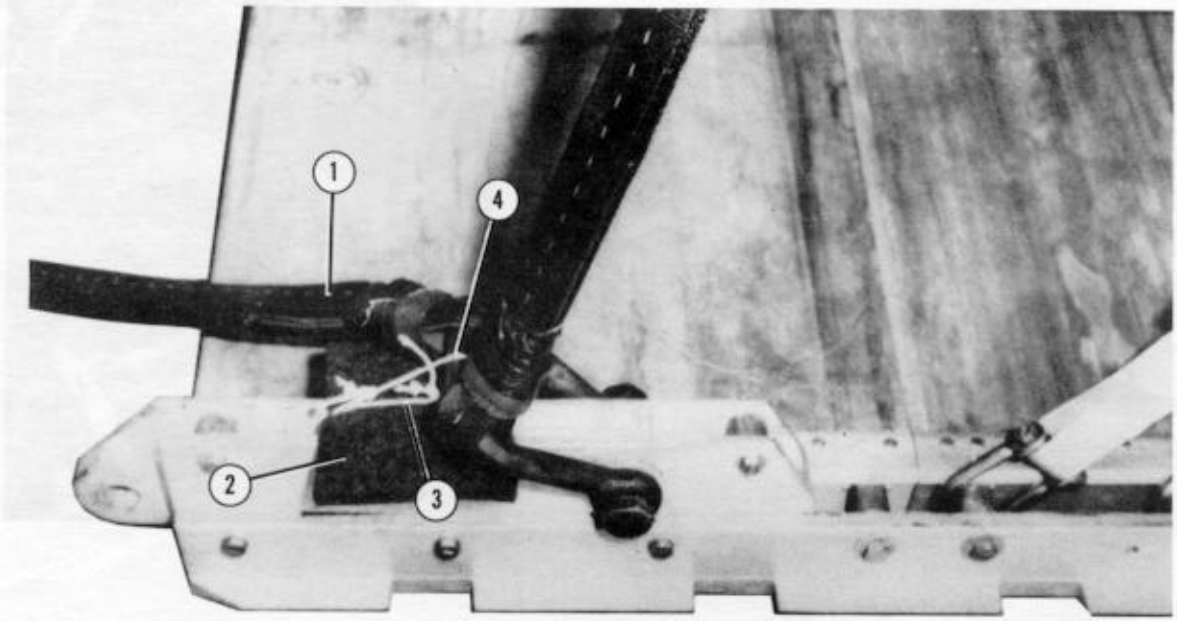
(4) If the airdrop load was not previously rigged with the SL/CS extraction system on the type II platform, it will not be rigged with the SL/CS extraction system on the type V platform.



(1) Attach the SL/CS extraction system to the load as shown in Figure 3-78.

(2) Use the deployment line as given in the specific rigging manual.

Figure 3-81. SL/CS extraction system attached for item extraction of a load on a type V platform



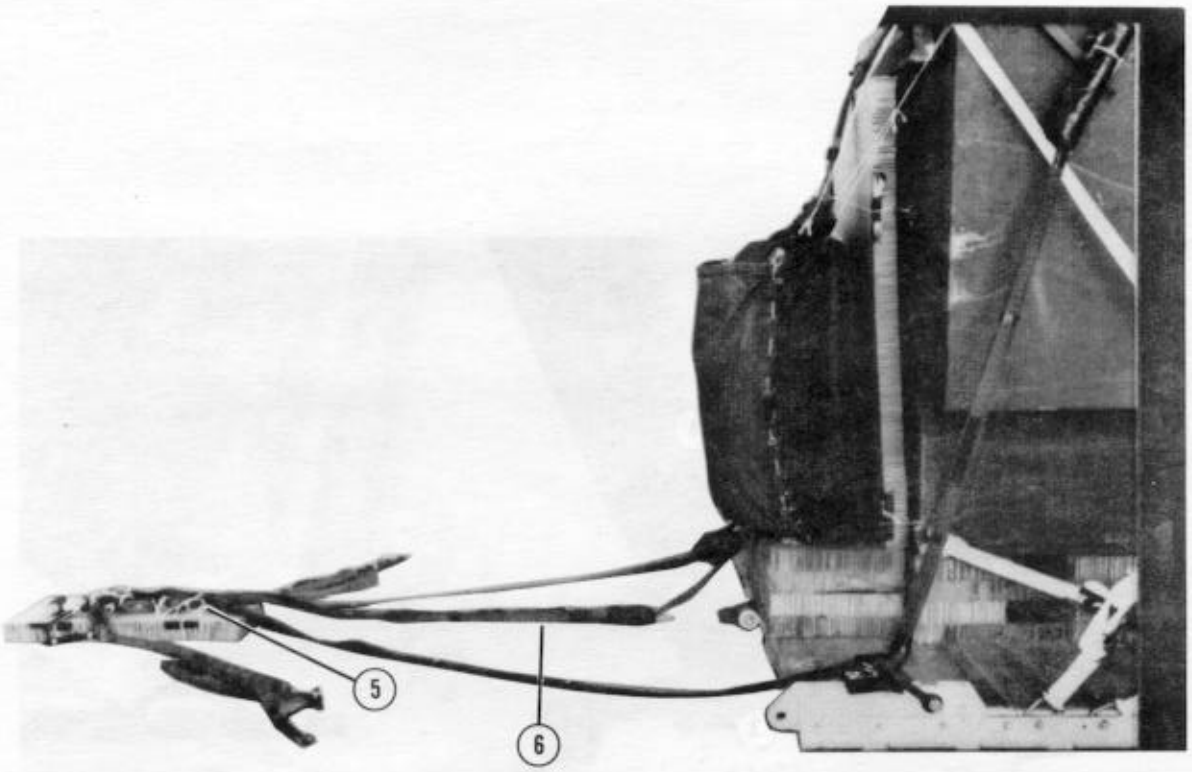
(1) Attach a 9-foot (3-loop), type X or a 9-foot (2-loop), type XXVI nylon webbing sling to the rear large suspension clevis on the tandem link on each rail inboard of the suspension sling.

(2) Place a 10- by 10-inch piece of felt padding on top of the tandem link behind the large suspension clevis.

(3) Secure the padding in place with type III nylon cord.

(4) Pull the clevis down to the felt padding, and secure it in place with type III nylon cord.

Figure 3-82. SL/CS extraction system attached for type V platform extraction by platform rails



(5) Attach the other end of each 9-foot sling to the attaching clevis of the SL/CS.

(6) Use a 16-foot (3-loop), type X or a 16-foot (2-loop), type XXVI nylon webbing deployment line.

Figure 3-82. SL/CS extraction system attached for type V platform extraction by platform rails (continued)

3-24. Low-Altitude Parachute-Extraction

Inspect and maintain the airdrop items used in LAPE as outlined in TM 10-1670-240-20/ TO 13C7-49-11.

a. ACB. The ACB is used on every platform-extracted LAPE airdrop load. Instructions for installing the ACB on a load are given in the specific rigging manual.

Note: The lower bar of the ACB must be on a plane level with or above the vertical CB of the load.

b. Extraction Slings. Extraction slings used to rig LAPE airdrop platform loads are made of type XXVI nylon webbing in 20- and 28-foot lengths. The 3-, 9-, 11-, and 16-foot (4-loop), type XXVI nylon webbing cargo slings may be used to rig a LAPE load. Table 3-2 gives the correct sling lengths to be used with LAPE airdrop loads. The 3-foot sling is normally used to extend a 20- or 28-foot sling. When this is done, the slings are connected with a 5 1/2-inch, two-point link. Extraction slings are attached to a load as described below.

(1) Item-Extracted Load. Attach the extraction slings directly to the drop item as outlined in the specific rigging manual for that particular drop item.

(2) Platform-Extracted Load. Attach and safety the extraction slings to the platform-extracted load as shown in Figures 3-83 and 3-84.

c. Extraction Line. An extraction line is connected to a four-point link on the rear of the LAPE load and the main cargo extraction parachute. See Table 2-10 for the correct size extraction line.

d. Drogue Extraction Line. The drogue extraction line is connected between the 15-foot drogue parachute and the main cargo extraction parachute. The drogue extraction line will always be a 60-foot (1-loop), type XXVI or type X nylon webbing sling.

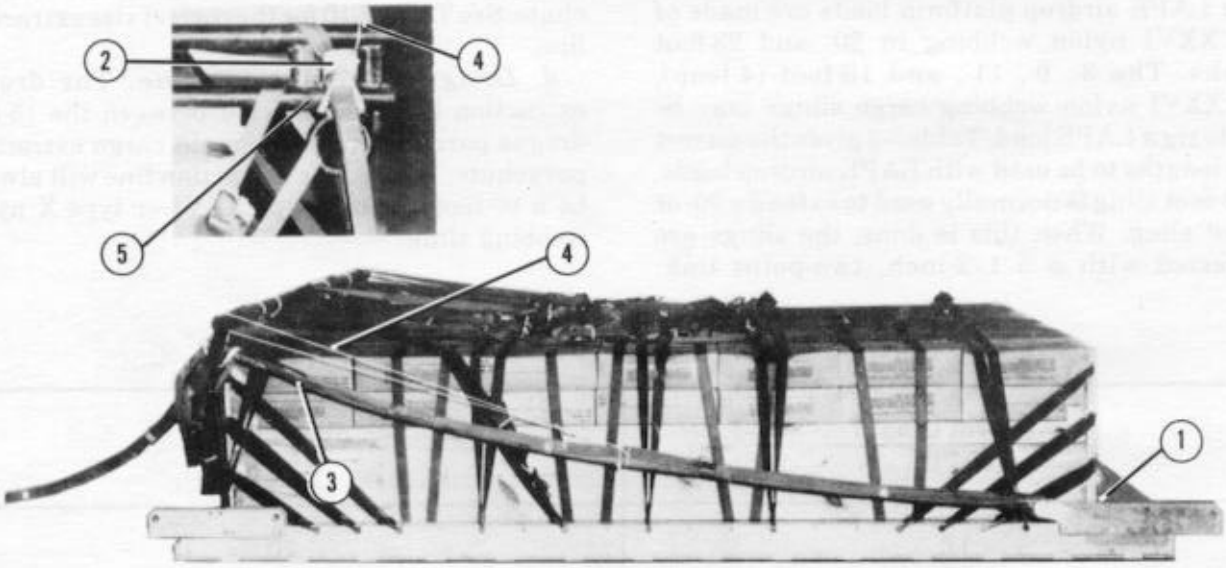
Table 3-2. Extraction slings for LAPE loads

Platform Length (feet)	*Sling Length (feet)
12	20
16	3 and 20
20	28
24	3 and 28
28	9 and 28
32	20 and 20

* All slings are made of type XXVI nylon webbing.

CAUTION

Make sure the nuts are tight enough to keep them from loosening during transport and airdrop.



(1) Bolt the extraction slings to the rear holes in the front bridle plates with 3 3/4-inch link assemblies on LAPE platforms. On type V platforms, install the extraction slings on large clevises and bolt the clevises to the suspension holes on the front tandem links.

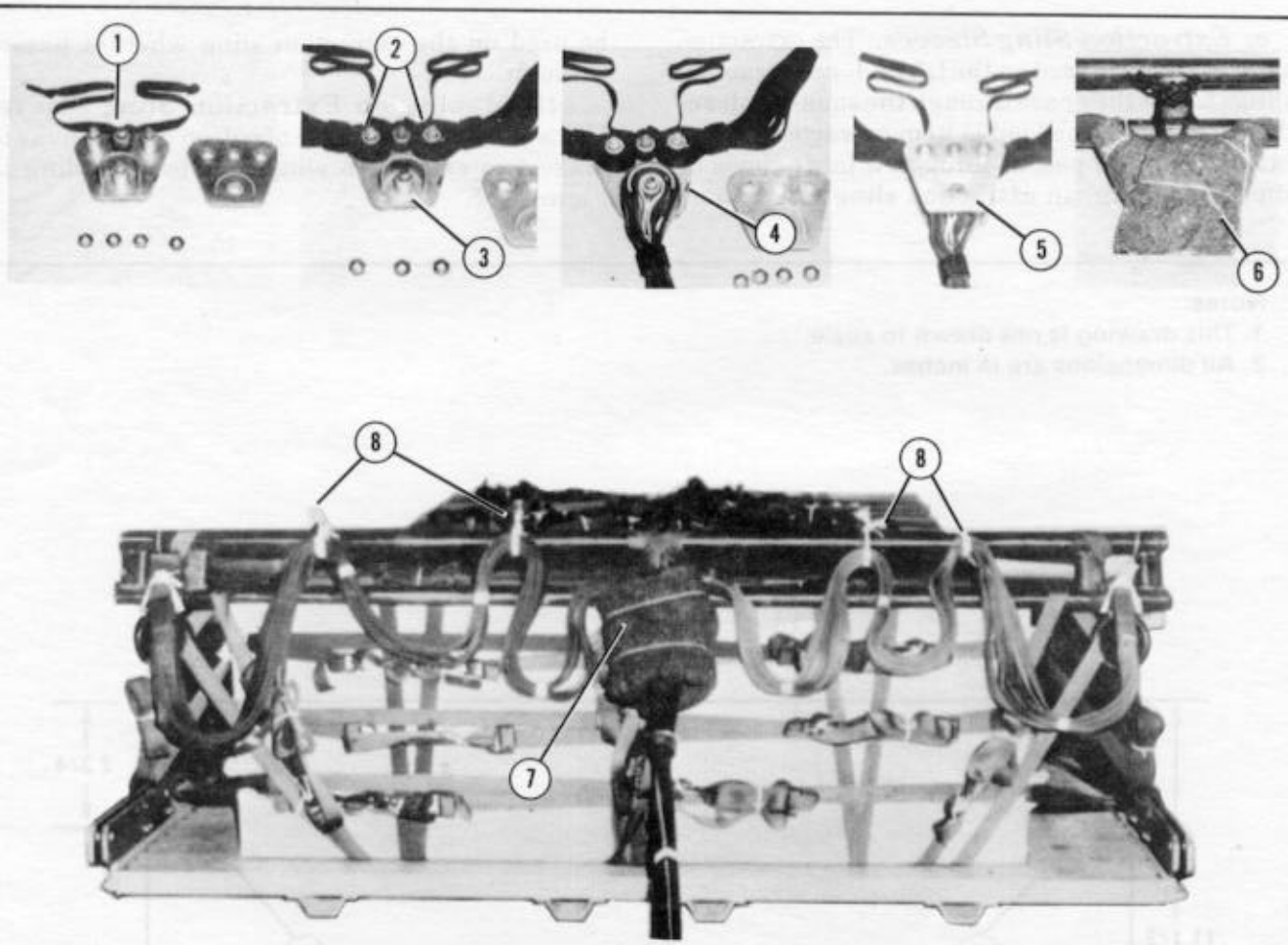
(2) Run the slings rearward and through the square holes of the ACB.

(3) Tape the slings for a distance of 24 inches on both sides of a point that will touch the ACB, or use locally made extraction sling sleeves. See Figures 3-85 and 3-86 for details on constructing and installing extraction sling sleeves.

(4) Tie the slings to the top bar of the ACB with type III nylon cord.

(5) Tie each sling to the ACB with a tie of five lengths of type I, 1/4-inch cotton webbing. Run the ties around the slings, under the bottom bar, and up and around the sling. Use a surgeon's knot and a locking knot to secure the ends of the ties.

Figure 3-83. Extraction slings attached to a platform-extracted LAPE load



1. Remove the cover from the four-point link assembly, and loop a length of 1-inch tubular nylon webbing on the center pin.
2. Run the load extraction slings from the ACB, and place their ends on the outside pins of the four-point link.
3. Put a 10-inch cotton buffer on the bottom pin of the four-point link.
4. Place the free end of a 60-foot extraction sling on the bottom pin and the separator. Divide the plies between the pin and separator.

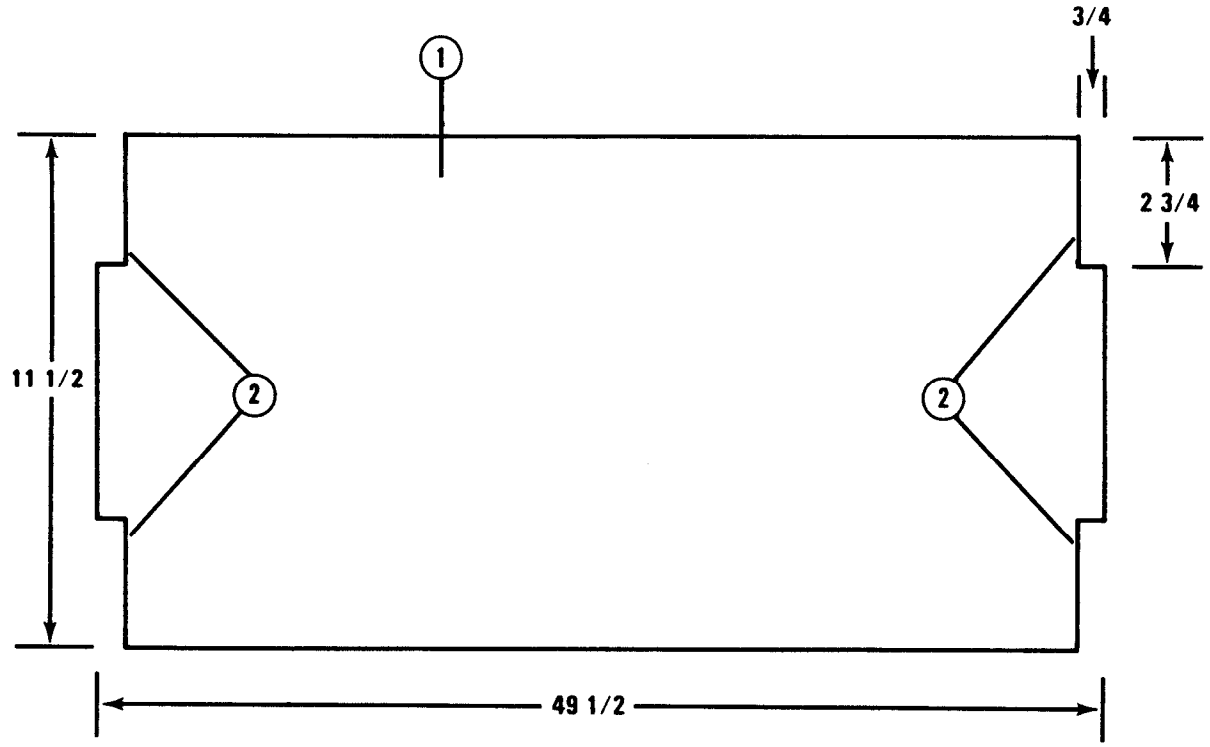
   Note: Do not use a separator with a 3-loop extraction sling.
5. Replace the cover, and hand tighten the nuts on their bolts.
6. Wrap the link with felt, or pad it with 18- by 18-inch pieces of honeycomb. Tie the padding in place with type III nylon cord.
7. Tie the link to the center brace of the ACB with the 1-inch tubular nylon webbing (step 1). Run the webbing all the way around the brace, and tie the ends of the webbing together with a surgeon's knot and a locking knot. Tie an overhand knot in each running end.
8. Tie the excess extraction slings to the ACB with four ties. Make each tie using five lengths of type I, 1/4-inch cotton webbing.

Figure 3-84. Four-point link assembled and tied to ACB

e. Extraction Sling Sleeves. The extraction sling sleeves are used on the LAPE load extraction slings where they pass through the square holes of the ACB. When the load is item-extracted and an extraction sling passes through a large clevis or similar opening, an extraction sling sleeve must be used on the extraction sling where it passes through.

(1) Making an Extraction Sling Sleeve. Use a 7- to 22-ounce piece of cotton duck canvas to make two extraction sling sleeves according to Figure 3-85.

Notes:
1. This drawing is not drawn to scale.
2. All dimensions are in inches.

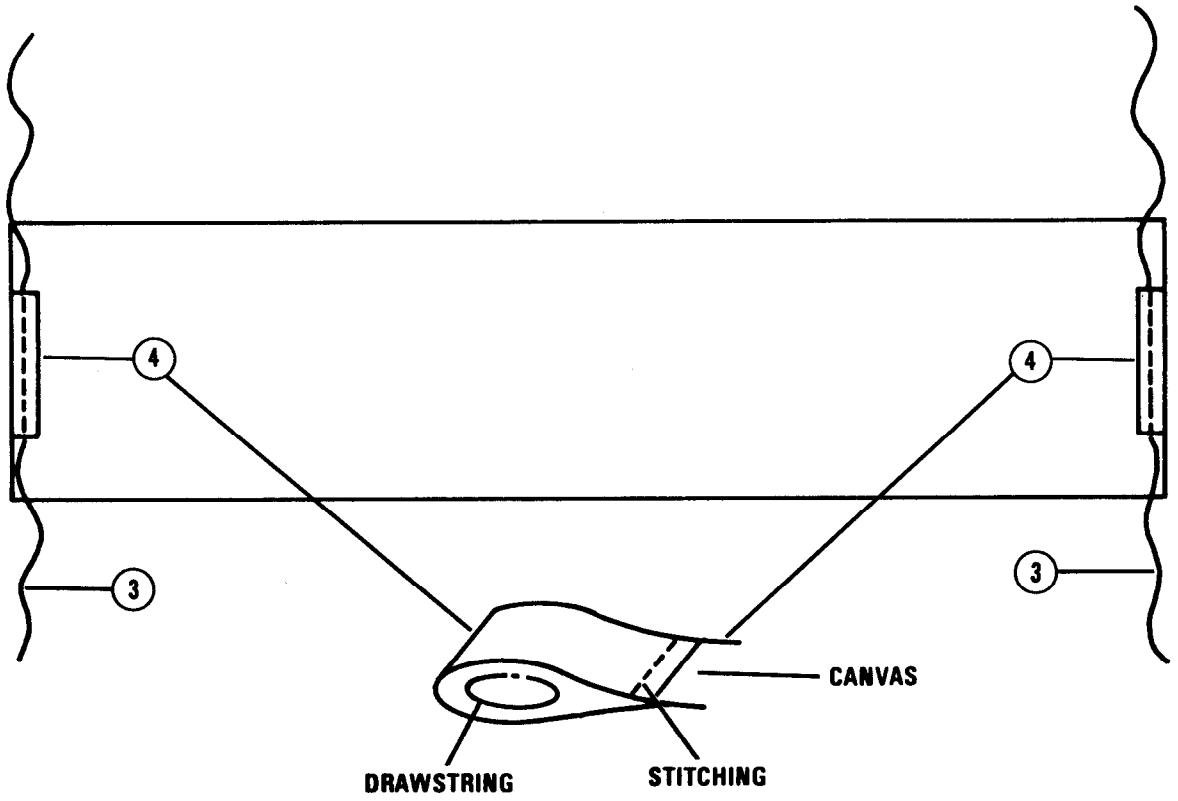


(1) Cut one 11 1/2- by 49 1/2-inch piece of 7- to 22-ounce cotton duck cloth.

(2) Make a 3/4- by 2 3/4-inch cutout in each corner of the cloth.

Figure 3-85. Extraction sling sleeve constructed

Notes:
1. These drawings are not drawn to scale.
2. The ends of all straight machine stitches must have a minimum of a 1/2-inch lockstitch.

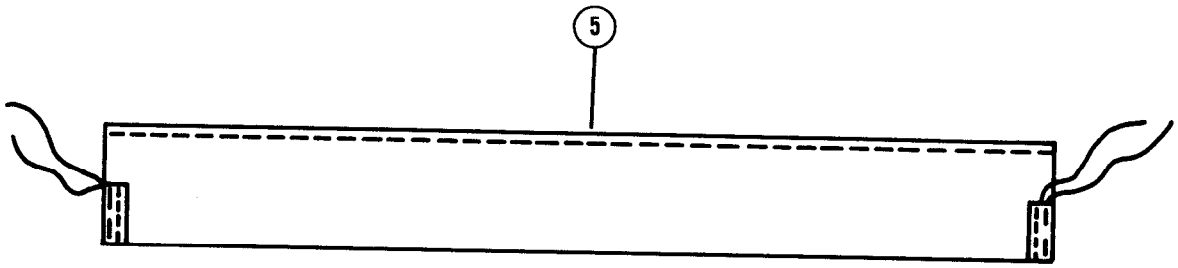


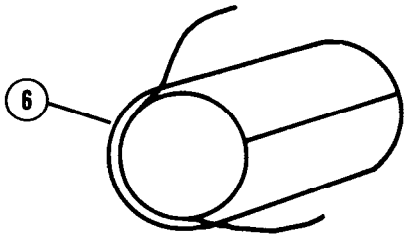
(3) Lay an 18-inch length of type III nylon cord (drawstring) 1 inch from each end of the cloth.

(4) Fold each end tab over its drawstring. Using size FF nylon thread, stitch each end tab (six to nine stitches per inch) with a type 301, class A stitch.

Figure 3-85. Extraction sling sleeve constructed (continued)

Notes:
1. **These drawings are not drawn to scale.**
2. **The ends of all straight machine stitches must have a minimum of a 1/2-inch lockstitch.**



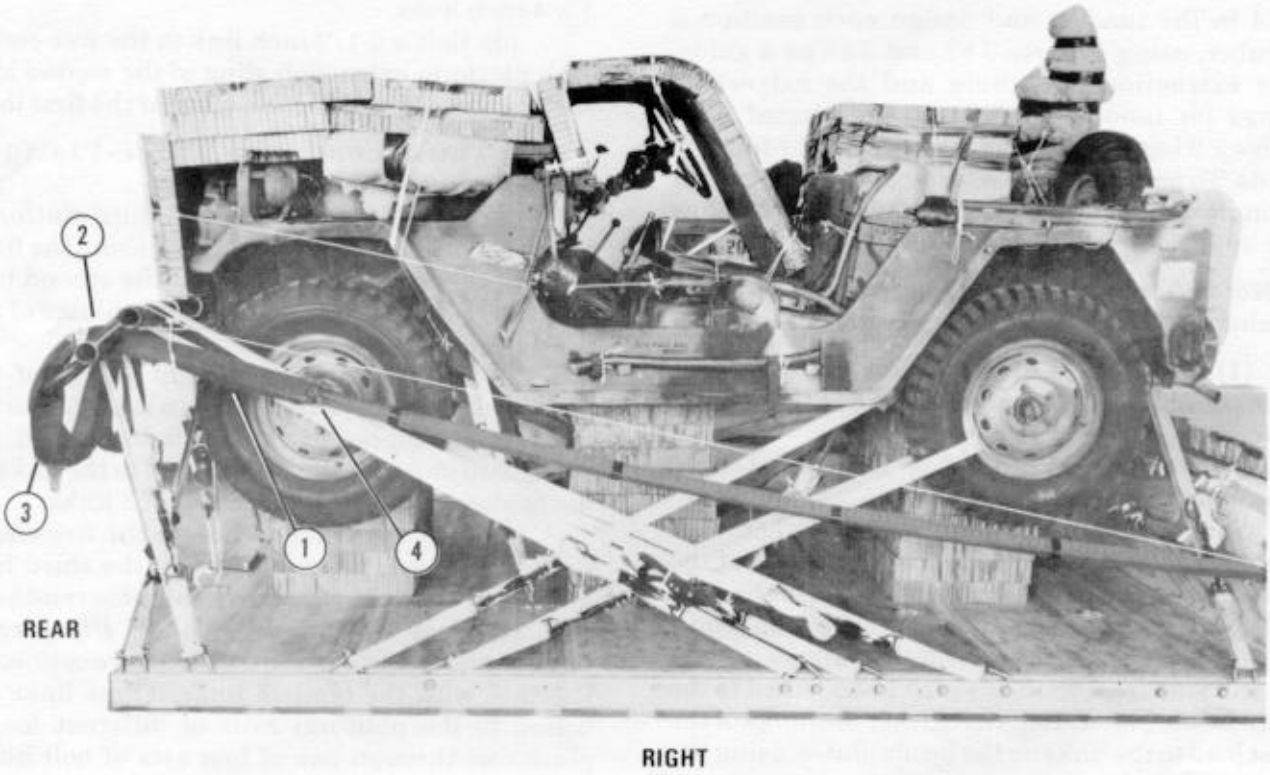


(5) Fold the cloth in half with the drawstring and the face of the material on the inside. Align the long edges, and stitch them (six to nine stitches per inch) with size FF nylon thread using a type 301, class A stitch.

(6) After sewing the edges, turn the sleeve inside out to place the drawstrings on the outside.

Figure 3-85. Extraction sling sleeve constructed (continued)

(2) Installing Extraction Sling Sleeves. Thread each extraction sling through an extraction sling sleeve. Place the sleeve on the extraction sling as shown in Figure 3-86 where it passes through the ACB, leaving 24 inches of sleeve on each side of the ACB. Tie the extraction sling sleeve to the extraction sling with the drawstrings.



(1) Slide an extraction sling sleeve on each extraction sling.

(2) Pass the extraction sling with extraction sling sleeve through the ACB square hole.

(3) Place the extraction sling sleeve with half the sleeve on each side of the ACB.

(4) Tie the sleeve to the extraction sling with the sleeve drawstrings.

Figure 3-86. Extraction sling sleeve installed on extraction sling

f. Tandem Loads for LAPE Platforms.

CAUTION

Tandem loads are platform-extracted and must be restrained to withstand a minimum force of 12 Gs forward, 3 Gs aft and lateral, and 4 Gs vertical.

LAPE platform loads are normally rigged for a single drop; however, they may be dropped in a two- or three-platform tandem drop. A two-platform tandem drop is shown in Figure 3-87, and a three-platform tandem drop is shown in Figure 3-88. Determine the correct position of each load in the tandem and assign each position a number, using Figures 3-87 and 3-88 as a guide. The extraction parachute and the extraction slings for tandem loads must be selected from Table 2-9 based on the total weight of the tandem loads. To prepare a load which has been rigged for a single drop to be a part of a tandem drop, follow the applicable steps cited below.

Note: A tandem load is assembled in the aircraft.

(1) First Load of a Tandem Drop. Untie, disassemble, and remove the four-point link assembly.

(2) Second Load of a Two-Platform Tandem Drop.

(a) Join the two platforms together with two articulated links, using the front holes of the front bridle plates of the first load and the rear holes of the rear bridle plates of the second load.

(b) Remove the extraction slings of the second load from the 3 3/4-inch links bolted to the front bridle plates. Bolt the extraction slings of the first load to the links on the bridle plates, using the 3 3/4-inch links.

(c) Bolt a 5 1/2-inch link to the free end of each platform extraction sling of the second load, and also bolt the links around the extraction slings of the first load.

Note: Be sure that the proper number of 28-foot cargo extraction parachutes are attached to the four-point link and that the parachutes have been packed for use with a LAPE drop.

(3) Second Load of a Three-Platform Tandem Drop.

(a) Untie, disassemble, and remove the four-point link assembly.

(b) Join the first and second platforms together with two articulated links, using the front holes of the front bridle plates of the first load and the rear holes of the rear bridle plates of the second load.

(c) Remove the extraction slings of the second load from the 3 3/4-inch links bolted to the front bridle plates. Bolt the extraction slings of the first load to the links on the bridle plates, using the 3 3/4-inch links.

(d) Bolt a 5 1/2-inch link to the free end of each platform extraction sling of the second load and around each extraction sling of the first load.

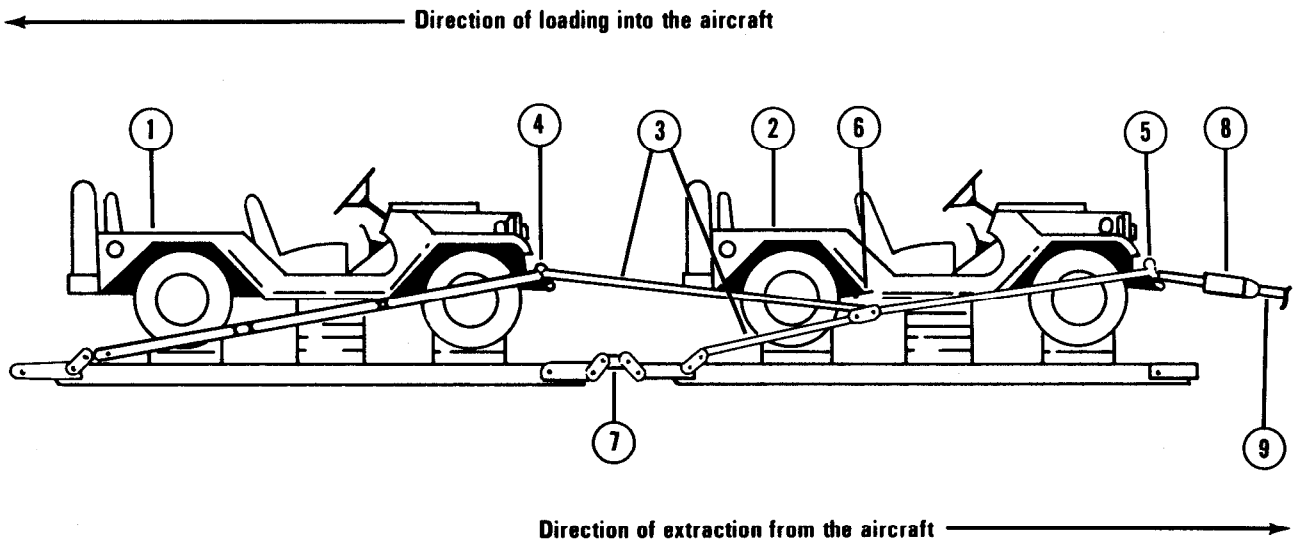
(4) Third Load of a Three-Platform Tandem Drop.

(a) Join the second and the third platforms together with two articulated links, using the front holes of the front bridle plates of the second load and the rear holes of the rear bridle plates of the third load.

(b) Remove the extraction slings of the third load from the 3 3/4-inch links bolted to the front bridle plates of the third load. Bolt the extraction slings of the second load to the links on the bridle plates using the 3 3/4-inch links.

(c) Bolt a 5 1/2-inch link to the free end of each platform extraction sling of the third load and around the extraction sling of the second load.

g. Tandem Loads for Type V Platforms. Type V platforms in a tandem load are connected together with the tandem links. These links are bolted to the platform rails of different length platforms through one of four sets of bolt holes. Bolt the tandem links to the platforms as directed in TM 10-1670-268-20&P/TO 13C7-52-22. After the platforms are in the aircraft, install the bolts in the tandem links to connect the loads in tandem according to TM 10-1670-268-20&P/TO 13C7-52-22. Adapt procedures in paragraph f above using large clevises to attach the extraction slings to the tandem links.



(1) The first platform load of a tandem LAPE drop. This platform is the first to be loaded into the aircraft and the last to be extracted.

(2) The second platform load is the last to be loaded, but the first to be extracted.

(3) A platform extraction sling. (A second sling is on the other side of the load.) The sling is bolted to the rear holes of the front bridle plate of the first load with a 3 3/4-inch link. The free end of the sling is bolted to the front bridle plate of the second load in a similar manner.

(4) Attitude control bar for the first load.

(5) Attitude control bar for the second load.

(6) A 5 1/2-inch link with one end bolted to the platform extraction sling of the second load and the other end bolted around the sling from the first load. This is a floating link; it is free to move along the sling from the second platform.

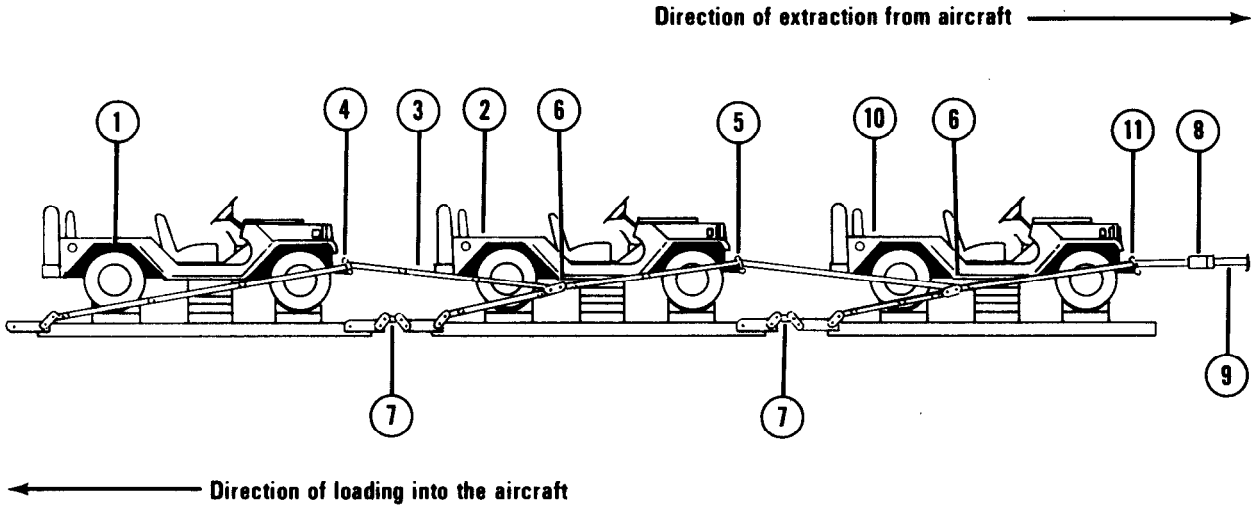
(7) An articulated link made from components of the 5 1/2- and 3 3/4-inch links hooks the platforms together.

(8) A four-point link hooks the platform extraction slings to the extraction line attached to the main extraction parachute.

(9) The extraction line bolted to the main extraction parachute.

Figure 3-87. A two-platform load for tandem LAPE airdrop

Note: Be sure that the correct number of 28-foot cargo extraction parachutes are attached to the four-point link and that the parachutes have been packed for use with a LAPE airdrop.



(1) The first platform load of a tandem LAPE drop. This platform is the first to be loaded into the aircraft and the last to be extracted.

(2) The second platform load.

(3) A platform extraction sling. (A second sling is on the other side of the load.) The sling is bolted to the rear holes of the front bridle plate of the first load with a 3 3/4-inch link. The free end of the sling is bolted to the front bridle plate of the second load in a similar manner.

(4) Attitude control bar for the first load.

(5) Attitude control bar for the second load.

(6) A 5 1/2-inch link with one end bolted to the platform extraction sling of the second load and the other end bolted around the sling from the first load. This is a floating link; it is free to move along the sling from the first platform.

(7) An articulated link made from components of the 5 1/2- and 3 3/4-inch links hooks the platforms together.

(8) A four-point link hooks the platform extraction slings to the extraction line attached to the main extraction parachute.

(9) The extraction line bolted to the main extraction parachute.

(10) The third platform load is the last to be loaded, but the first to be extracted.

(11) Attitude control bar for the third load.

Figure 3-88. A three-platform load for tandem LAPE airdrop

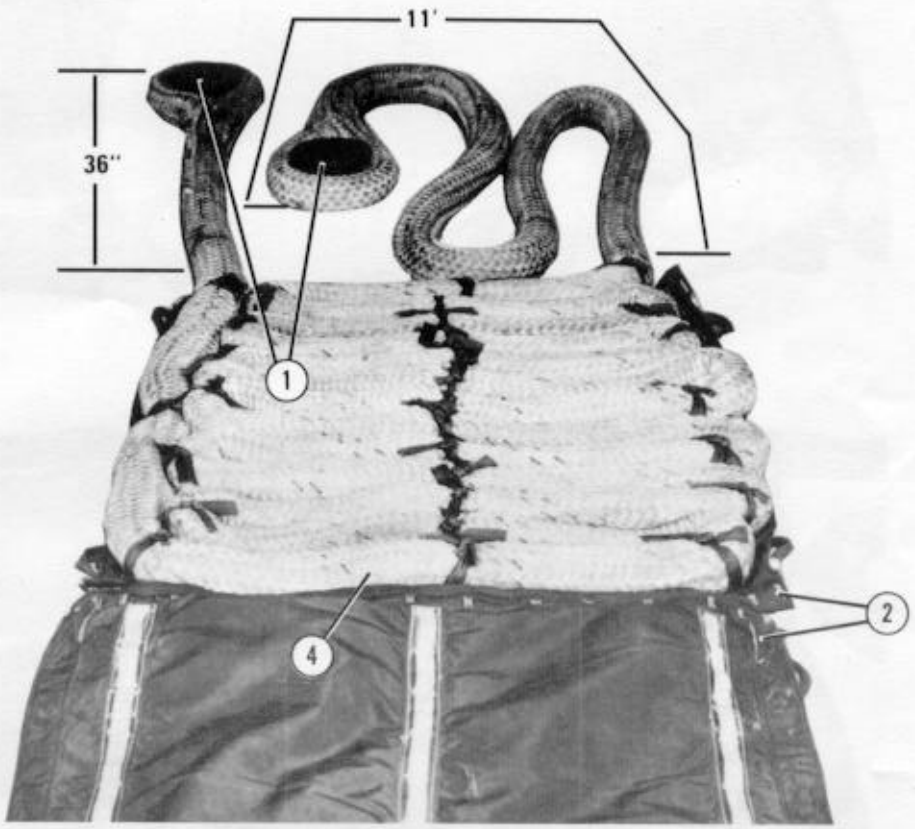
3-25. Parachute Extraction System for LAPE

Use either the single, double, or triple 28-foot, heavy-duty parachute system or the double 35-foot cargo extraction parachute system as given below.

a. Single, Double, or Triple 28-Foot, Heavy-Duty Parachute System. Build and install the single, double, or triple 28-foot, heavy-duty parachute system according to TM 10-1670-286-20/TO 13C5-2-41.

b. Double 35-Foot Cargo Extraction Parachute System.

(1) Build, install, and transport the double 35-foot cargo extraction parachute system as shown in Figures 3-89 through 3-104.



(1) Straighten a 60-foot (7-inch circumference) rope (not shown). Ensure that plastic spools are inserted into both looped ends of the rope. Make sure there are no excessive twists in the rope.

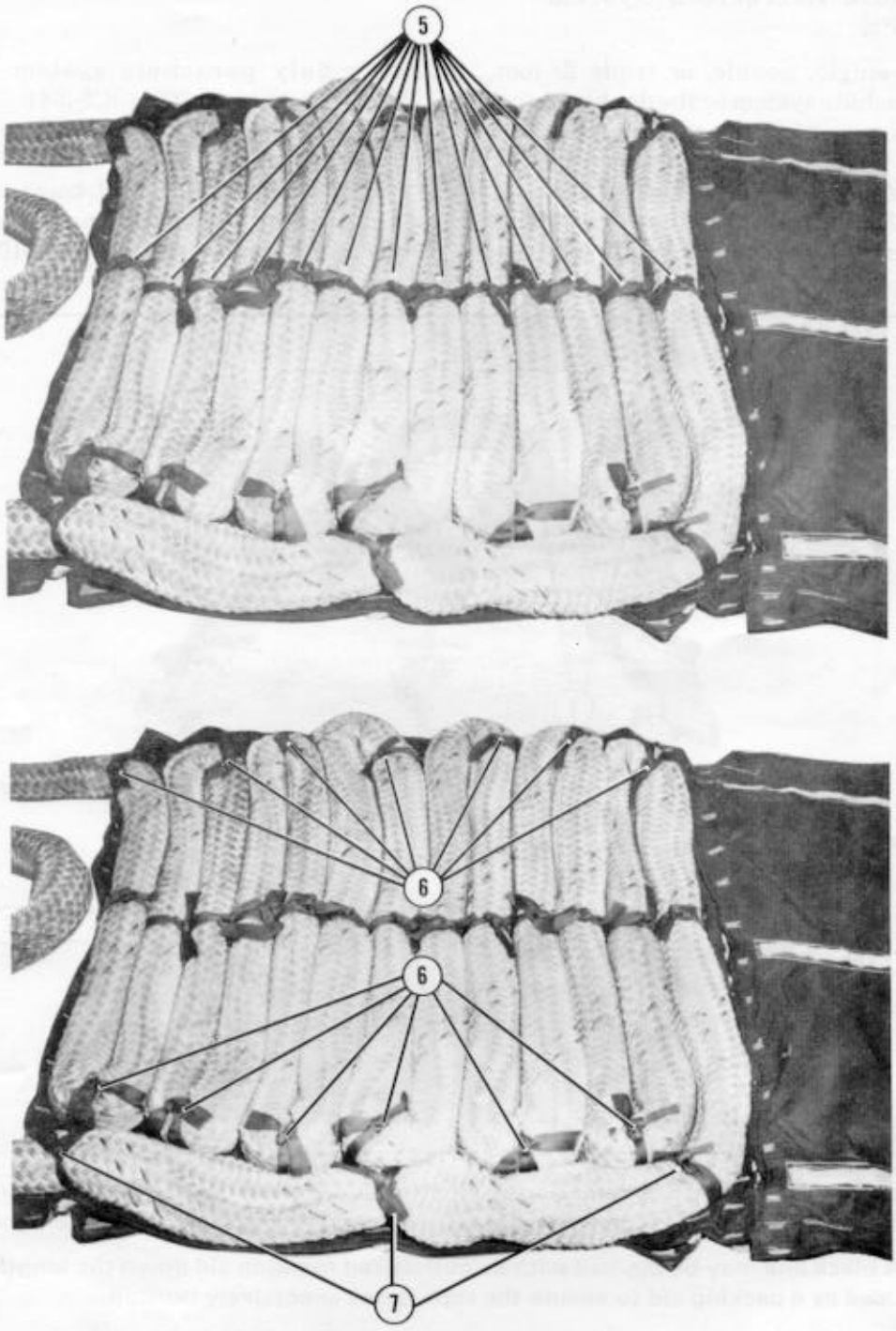
Note: A black line may be marked with an authorized marking aid down the length of the rope. This is used as a packing aid to ensure the rope is not excessively twisted.

(2) Place two extraction line leafs end to end with the tie straps up. One leaf will be used as the bottom leaf, the other will be used as the top leaf.

(3) Girth hitch thirteen 20-inch lengths of 1-inch cottom tape to the center tie strap loops (not shown).

(4) Starting 36 inches from one looped end of the rope, run the rope along the side and top of the bottom leaf. S-fold the remaining rope on top of the leaf, leaving an 11-foot length.

Figure 3-89. Extraction line leafs prepared



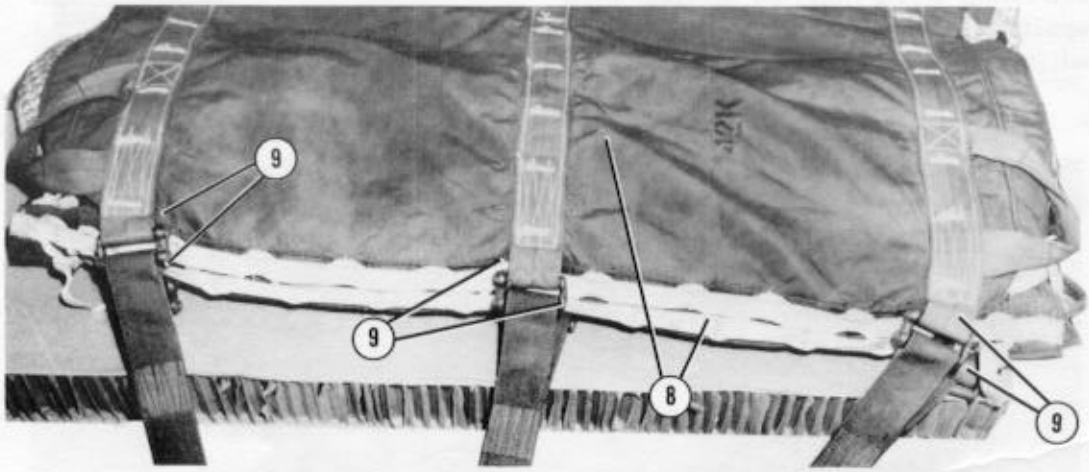
(5) Use the tape placed in step 3 to secure the rope in place with a surgeon's knot and a locking knot.

(6) Girth hitch 20-inch lengths of 1-inch cotton tape to the tie strap loops at each S-fold of the rope.

(7) Girth hitch 20-inch lengths of 1-inch cotton tape to the tie strap loops. Tie the rope along the side in three places.

Figure 3-89. Extraction line leafs prepared (continued)

Note: Honeycomb is used for photography purposes only.



(8) Lay the top extraction line leaf on top of the rope. Lace the forward end of the extraction line leafs with an 80-inch length of 1/2-inch tubular nylon webbing. Tie each end with three alternating half hitches and an overhand knot.

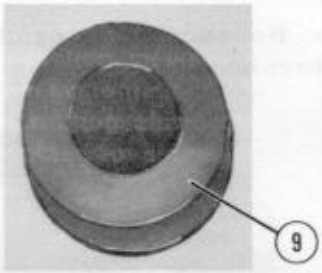
(9) Attach an extraction bridle according to TM 10-1670-286-20/TO 13C5-2-41.

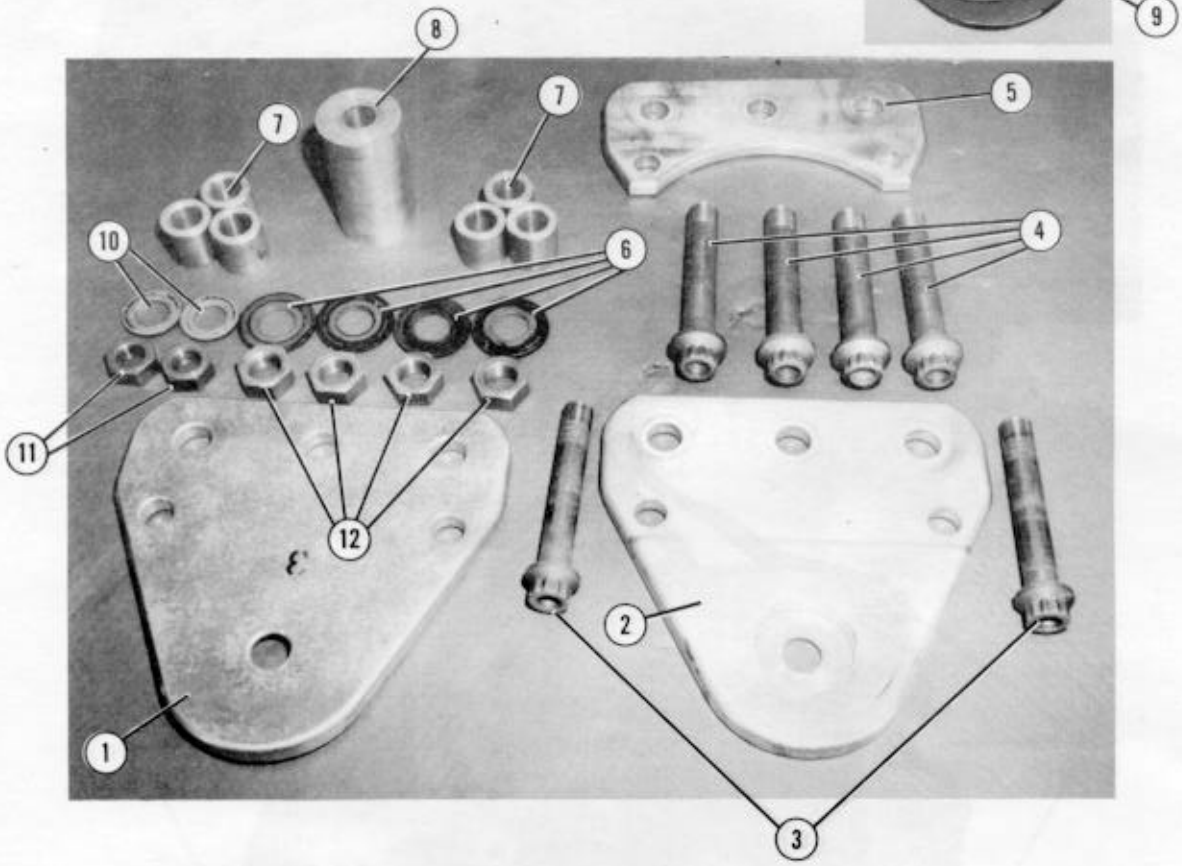
(10) Lace the aft end of the extraction line leafs with two 80-inch lengths of ticket number 5 or 8/7 cotton thread. Tie each end with three alternating half hitches and an overhand knot.

(11) Use two 10-inch lengths of type I, 1/4-inch cotton webbing to tie the closing loops together with a surgeon's knot and a locking knot.

Figure 3-89. Extraction line leafs prepared (continued)

Notes:
1. Two extraction clevises are required for this extraction system.
2. Each extraction clevis must be disassembled and inspected for serviceability before it can be installed.

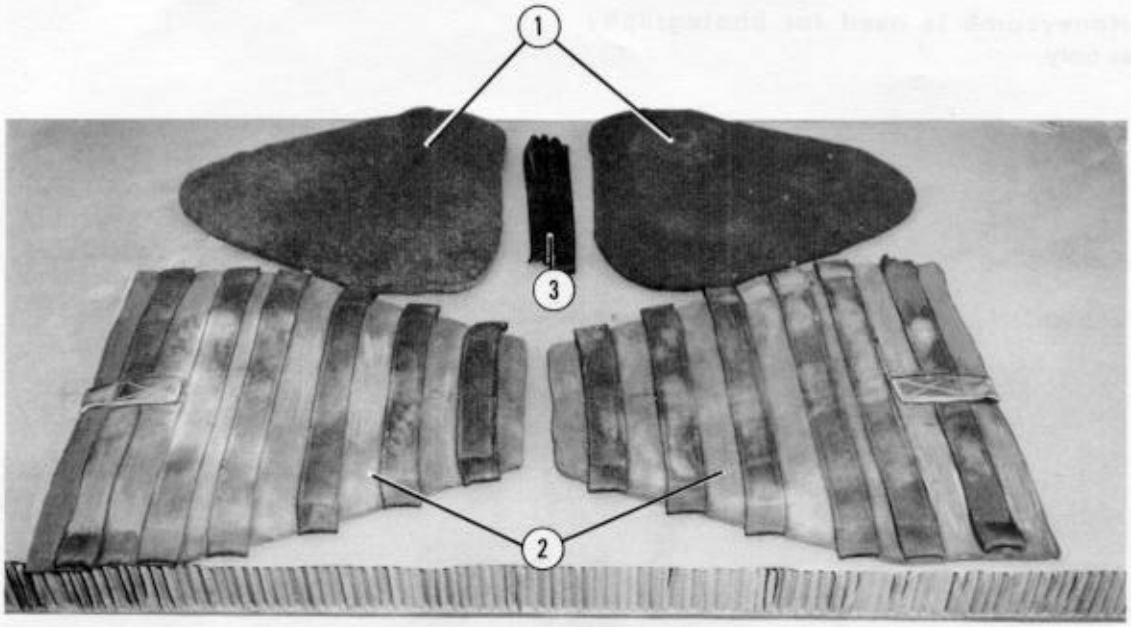




Item Number	Description
1	Side Plate (Top Plate)
2	Side Plate (Baseplate)
3	Small Bolts
4	Large Bolts
5	Center Plate
6	Large Washers
7	Spacers
8	Spool Insert
9	Plastic Spool (two needed)
10	Small Washers
11	Small Nuts
12	Large Nuts

Figure 3-90. Components of an extraction clevis

Note: Honeycomb is used for photography purposes only.

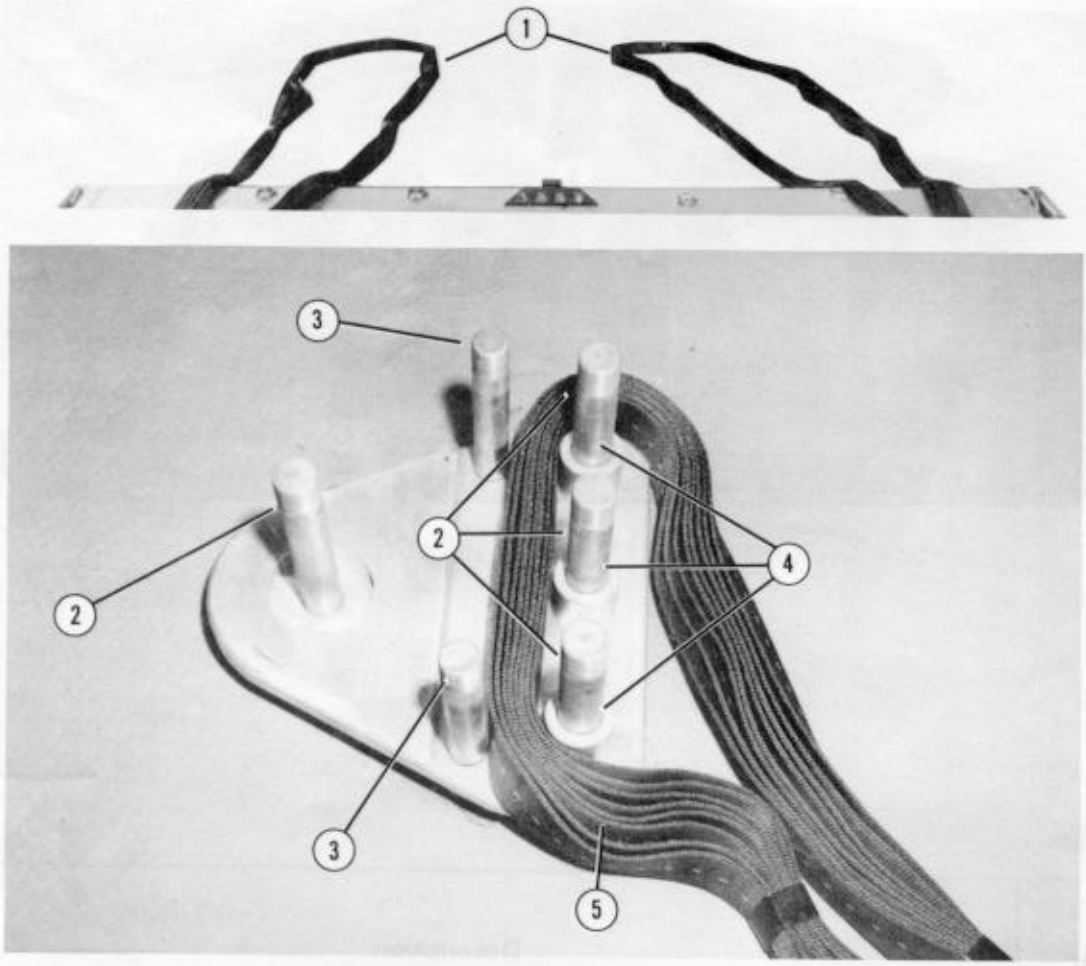


Item Number	Description
1	Two pieces of 1/2-inch felt are required for each extraction clevis. Using a side plate as a pattern, cut felt 1 inch larger than the side plate in all directions.
2	Two link protectors are required for each extraction clevis.
3	One 10-foot length of 1-inch tubular nylon webbing.
4	One 30-inch length of 1/2-inch tubular nylon webbing (not shown).
5	Two 10-foot lengths of 1/2-inch tubular nylon webbing (not shown).

Figure 3-91. Accessories for the extraction clevis

(2) If the parachute system is built at a separate facility, adapt the procedures in Figures 3-92 through 3-100. Prepare the parachute system for transport as shown in Figure 3-104. Install the parachute system when the load is in the aircraft as shown in Figure 3-105.

Note: Honeycomb is used for photography purposes only.



(1) Lay the extraction slings so that there is uniform tension in the slings.

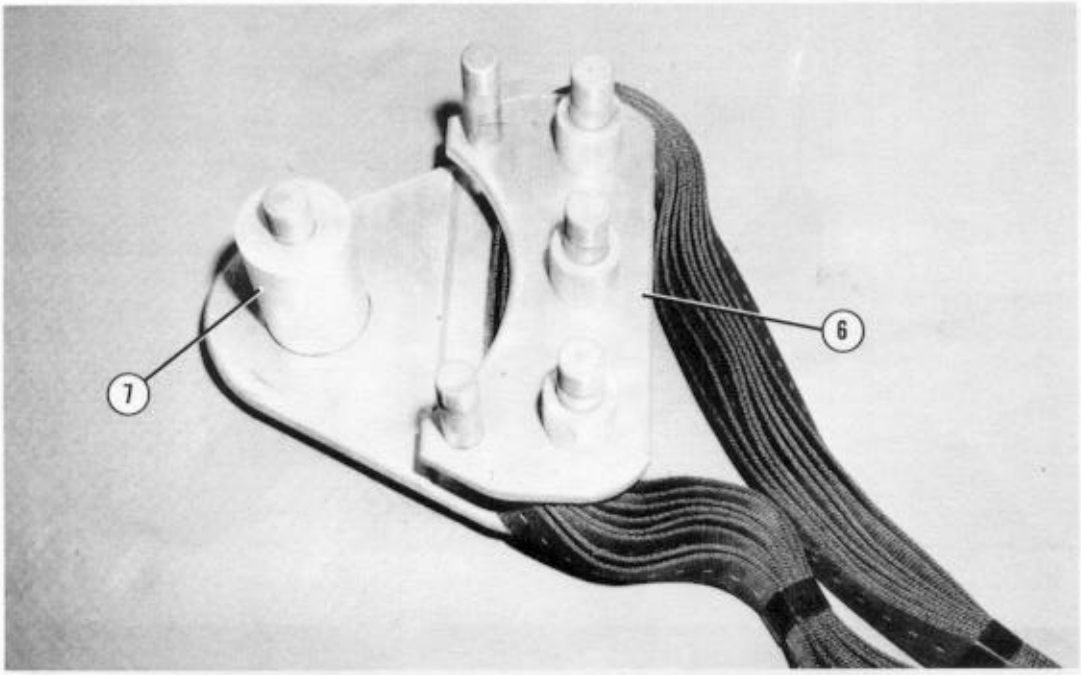
(2) Position the baseplate so that the grooved portion is facing up. Place the large bolts in the front and rear holes of the baseplate.

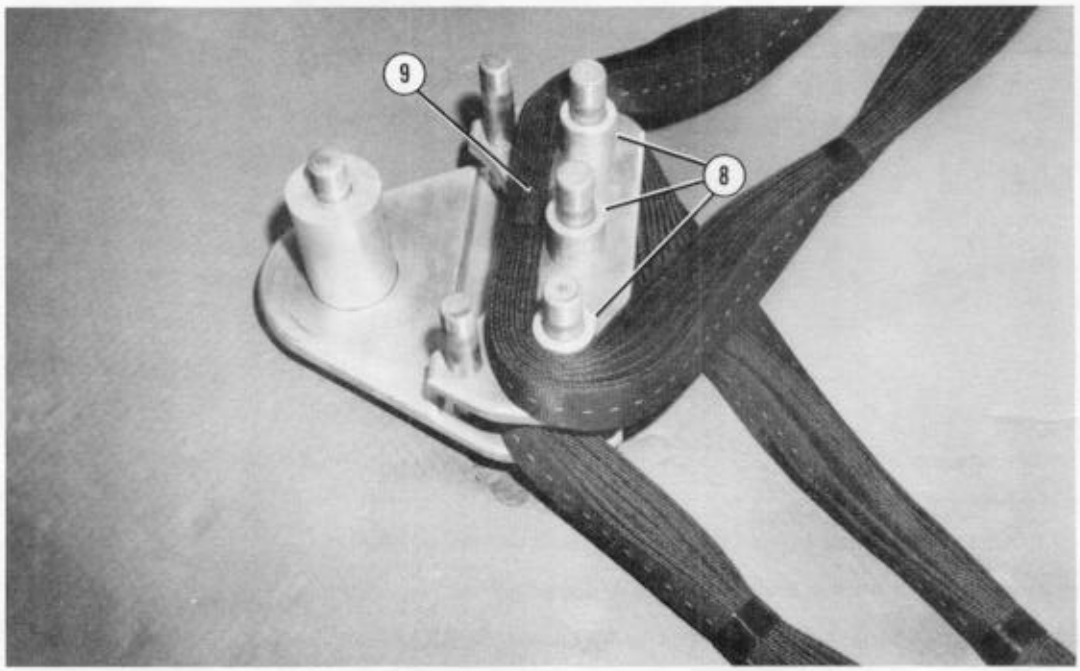
(3) Place the small bolts in the middle holes of the baseplate.

(4) Place a spacer on each of the three rear bolts.

(5) Route the right extraction sling around the three rear bolts.

Figure 3-92. Forward extraction clevis assembled





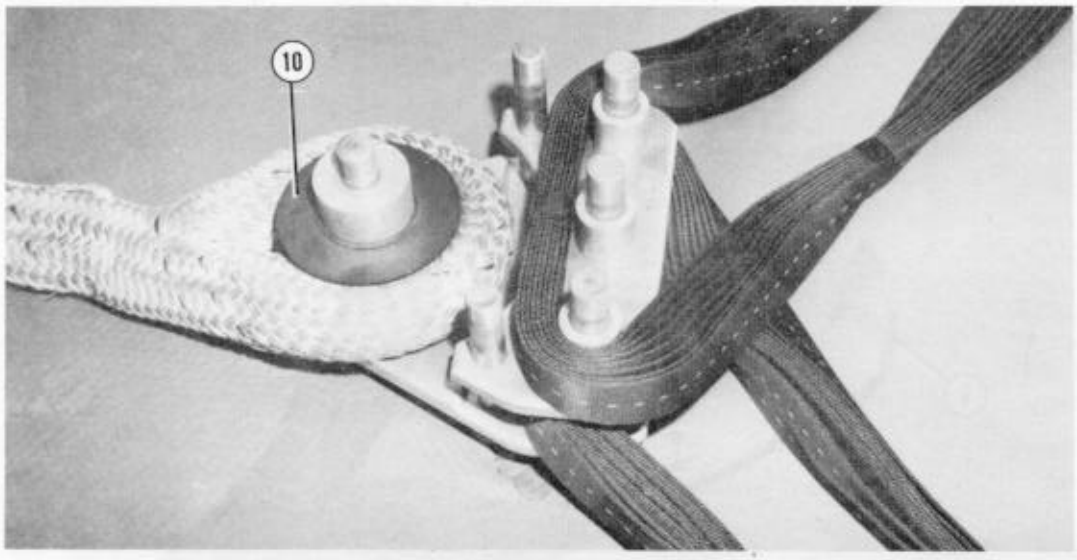
(6) Place the center plate on the rear and middle bolts and right extraction sling.

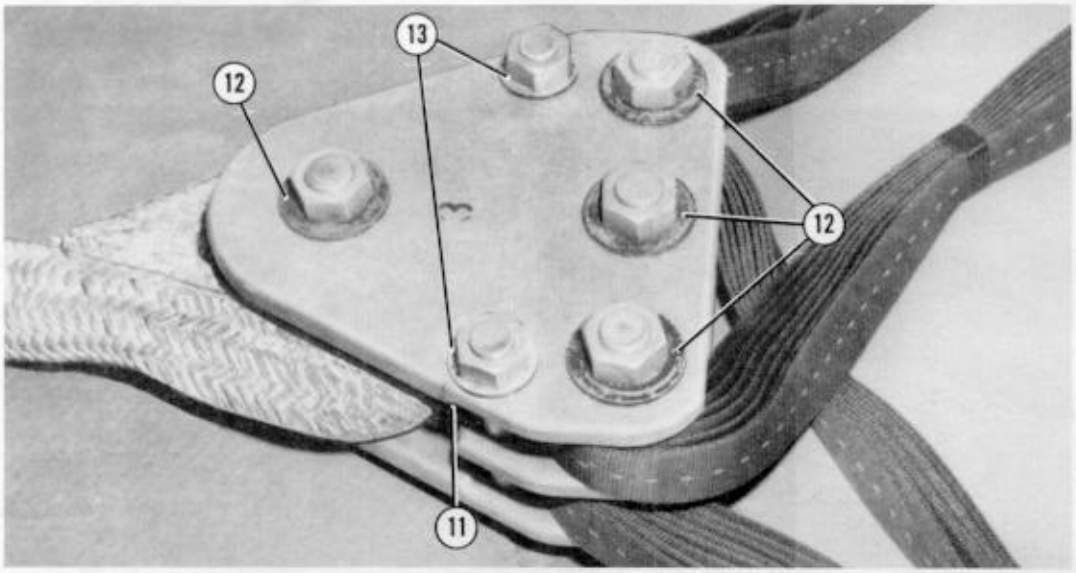
(7) Place a spool insert on the front bolt.

(8) Place a spacer on each of the three rear bolts.

(9) Route the left extraction sling around the three rear bolts.

Figure 3-92. Forward extraction clevis assembled (continued)





(10) Place the 11-foot looped end of the rope around the spool insert.

(11) Place the top plate on the bolts with the grooved portion facing down.

(12) Place the large washers and nuts on the three rear bolts and on the front bolt.

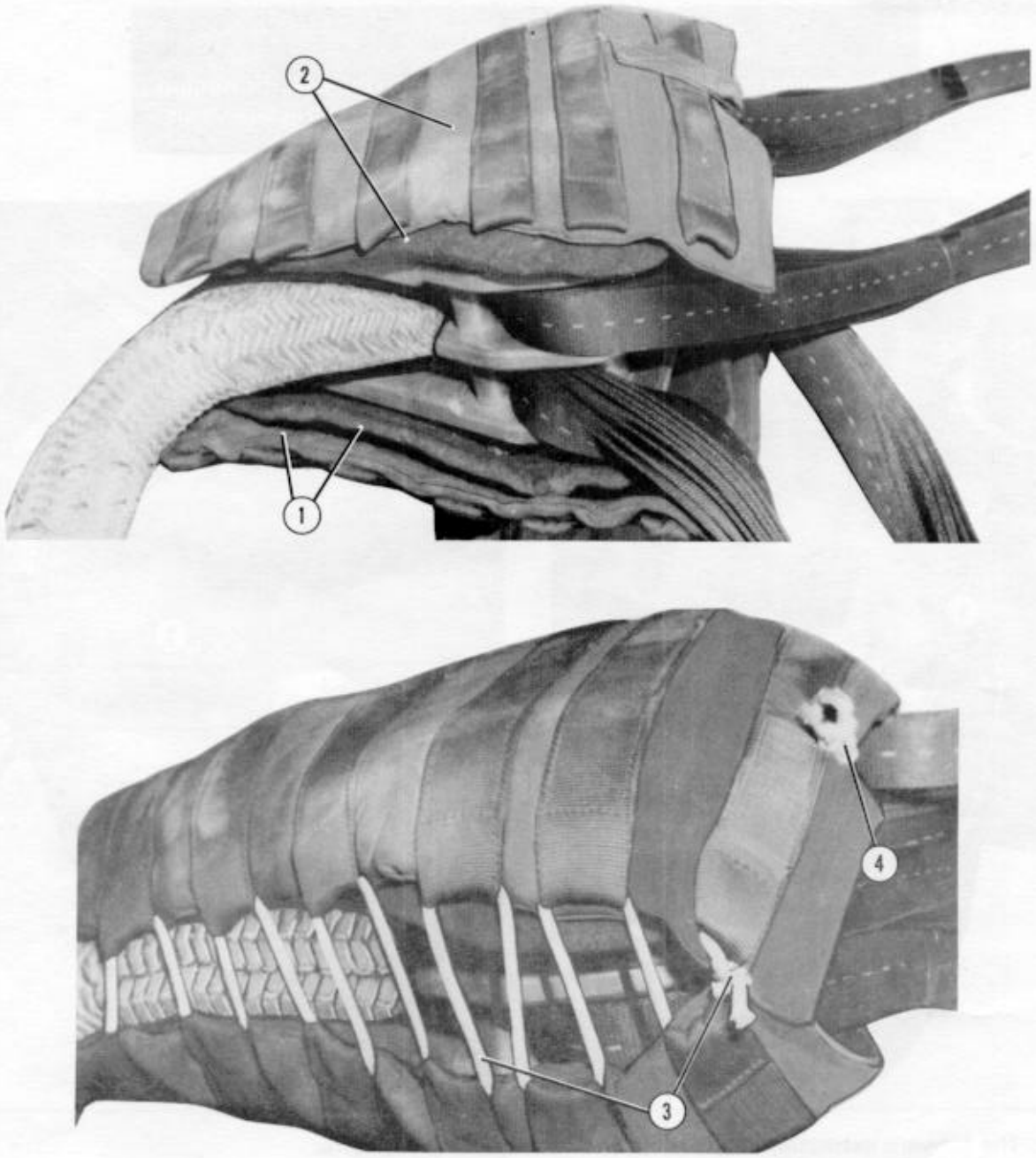
(13) Place the small washers and nuts on the middle bolts.

(14) Tighten the bolts wrench tight (not shown).

CAUTION

Do not overtighten the bolts, as this may strip the threads.

Figure 3-92. Forward extraction clevis assembled (continued)



(1) Place a precut piece of felt and a link protector under the extraction clevis.

(2) Place a precut piece of felt and a link protector on top of the extraction clevis.

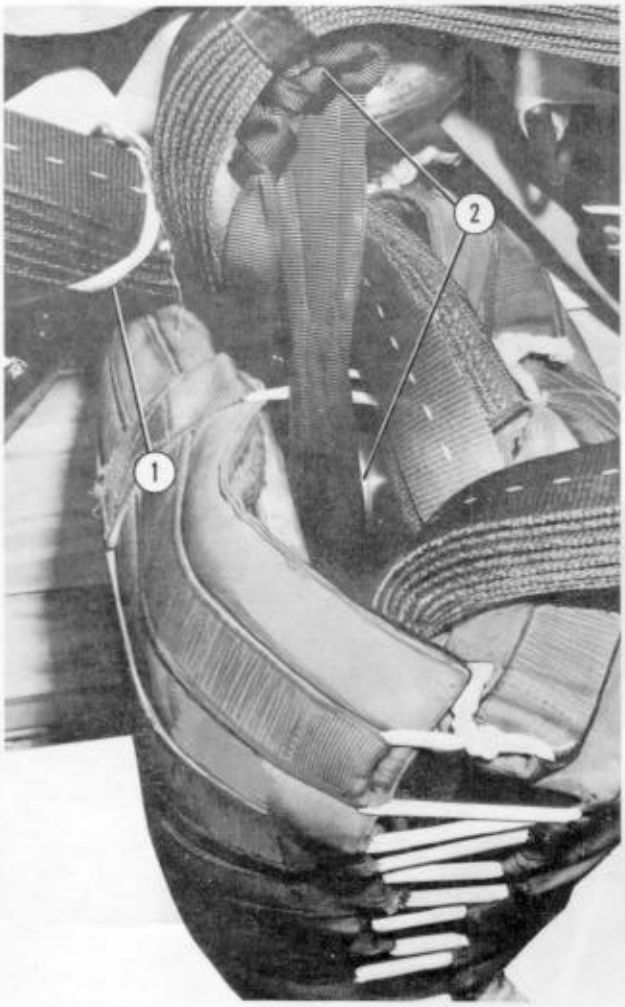
(3) Lace the covers together with a 10-foot length of 1/2-inch tubular nylon webbing. Tie the ends with a surgeon's knot and a locking knot with an overhand knot in the ends.

(4) Pass one end of a 30-inch length of 1/2-inch tubular nylon webbing through the top loop, down through the bottom loop, and back through the top loop. Tie the ends with a surgeon's knot and a locking knot with an overhand knot in the ends.

Figure 3-93. Link protectors secured

CAUTION

Depending on the load to be dropped, refer to the specific rigging manual for the appropriate attaching point of the extraction clevis.



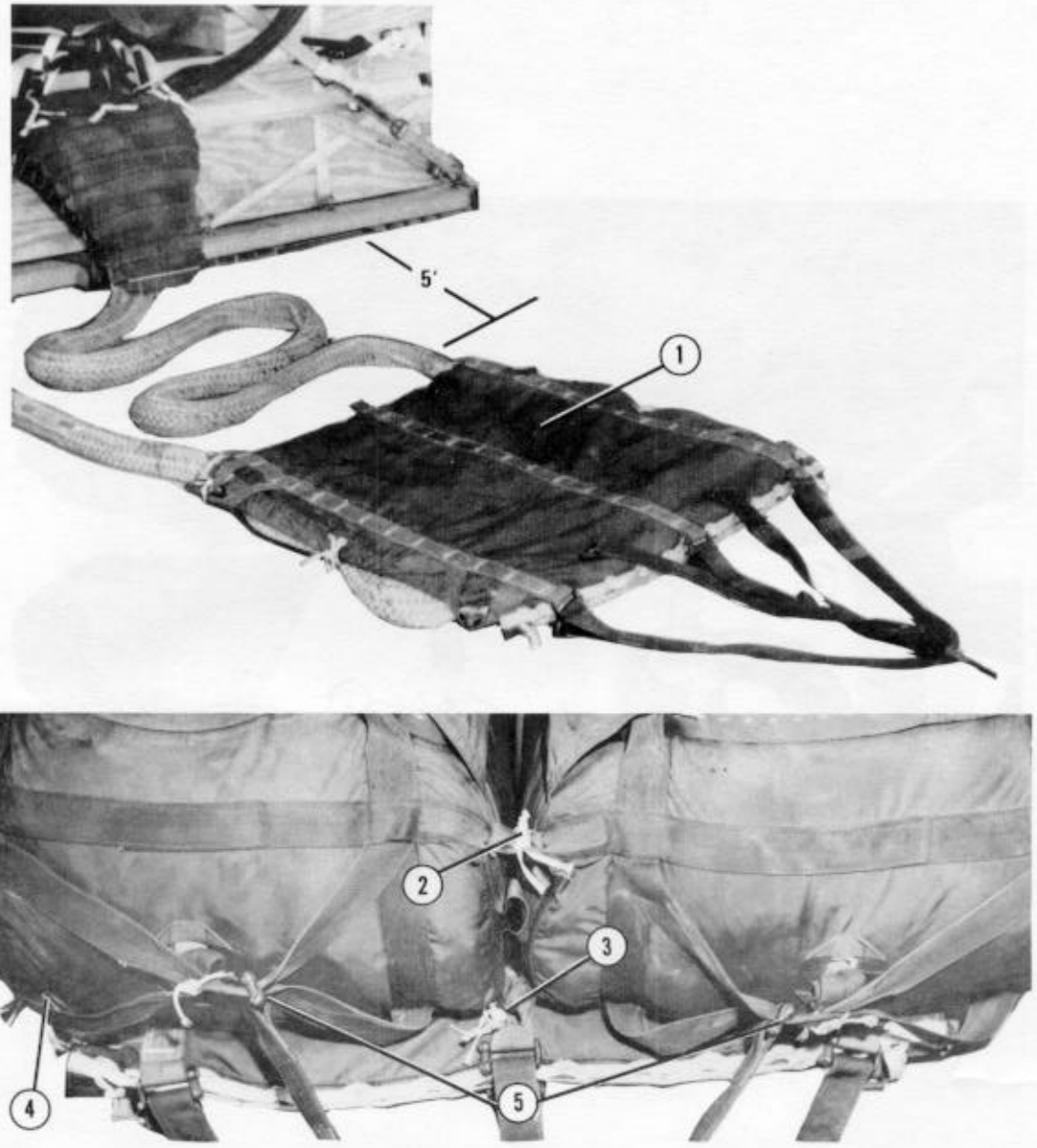
Note: The forward extraction clevis is shown attached to the lunette.

(1) Tie the left extraction sling with two turns single of type I, 1/4-inch cotton webbing with a surgeon's knot and a locking knot.

(2) Turn the extraction clevis to the left. Route a 10-foot length of 1-inch tubular nylon webbing to the appropriate attaching point through the top center spacer of the extraction clevis with four turns single. Tighten the webbing to raise the clevis to the lunette. Tie the ends with a surgeon's knot and a locking knot with an overhand knot in the ends. Turn the link back to the original position.

(3) Tie the right extraction sling with two turns single of type I, 1/4-inch cotton webbing with a surgeon's knot and a locking knot.

Figure 3-94. Forward extraction clevis attached to load



(1) Place the extraction line leaf within 5 feet of the load.

(2) Place two 35-foot cargo extraction parachutes on the extraction line leaf. Tie the upper inner bag loops together with two 10-inch lengths of type I, 1/4-inch cotton webbing.

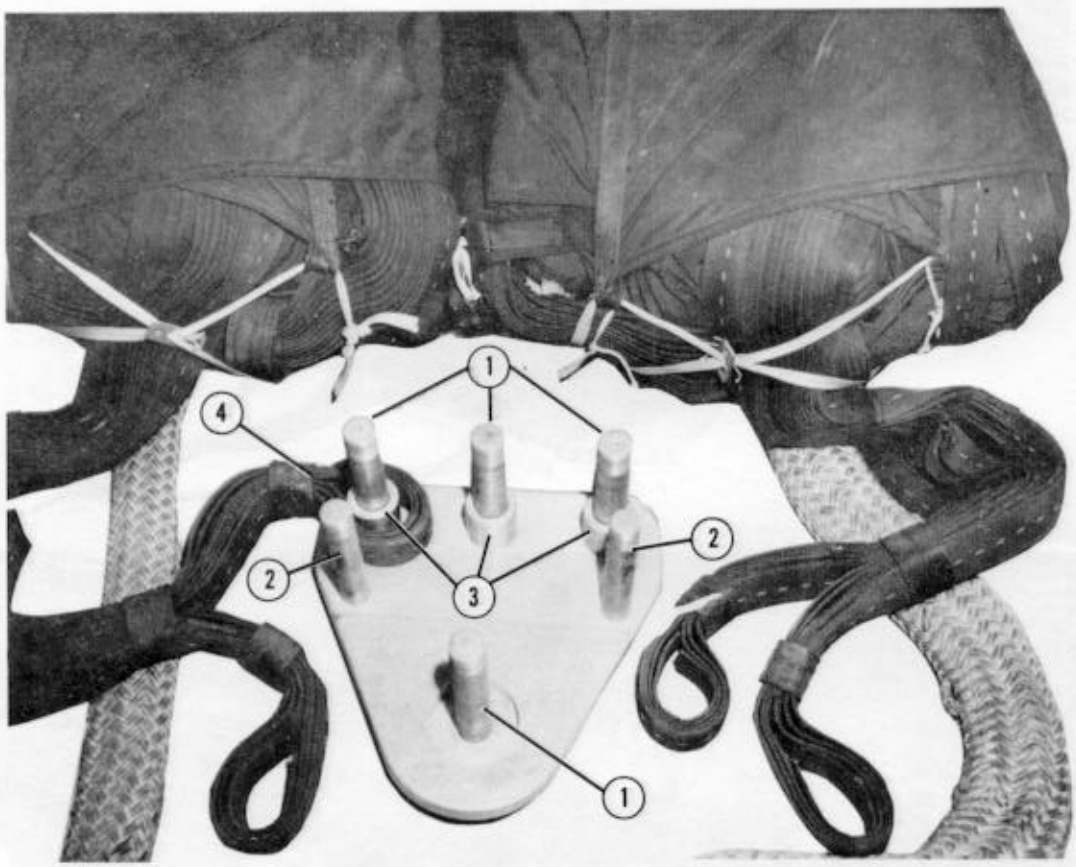
(3) Tie the lower bag loops to the center bridle attaching loop of the top line leaf.

(4) Tie the outer bag loops to the securing loops of the line leaf with two 10-inch lengths of type I, 1/4-inch cotton webbing.

(5) Secure the connector links to the inner portion of the bag bridle ties.

Note: Make sure that the parachute bridle and the bag bridle are tied together with a length of type III nylon cord.

Figure 3-95. Parachutes placed on extraction line leafs



(1) Position the baseplate so that the grooved portion is facing up and the rear of the baseplate is to the rear of the parachutes. Place the large bolts in the front and rear holes of the baseplate.

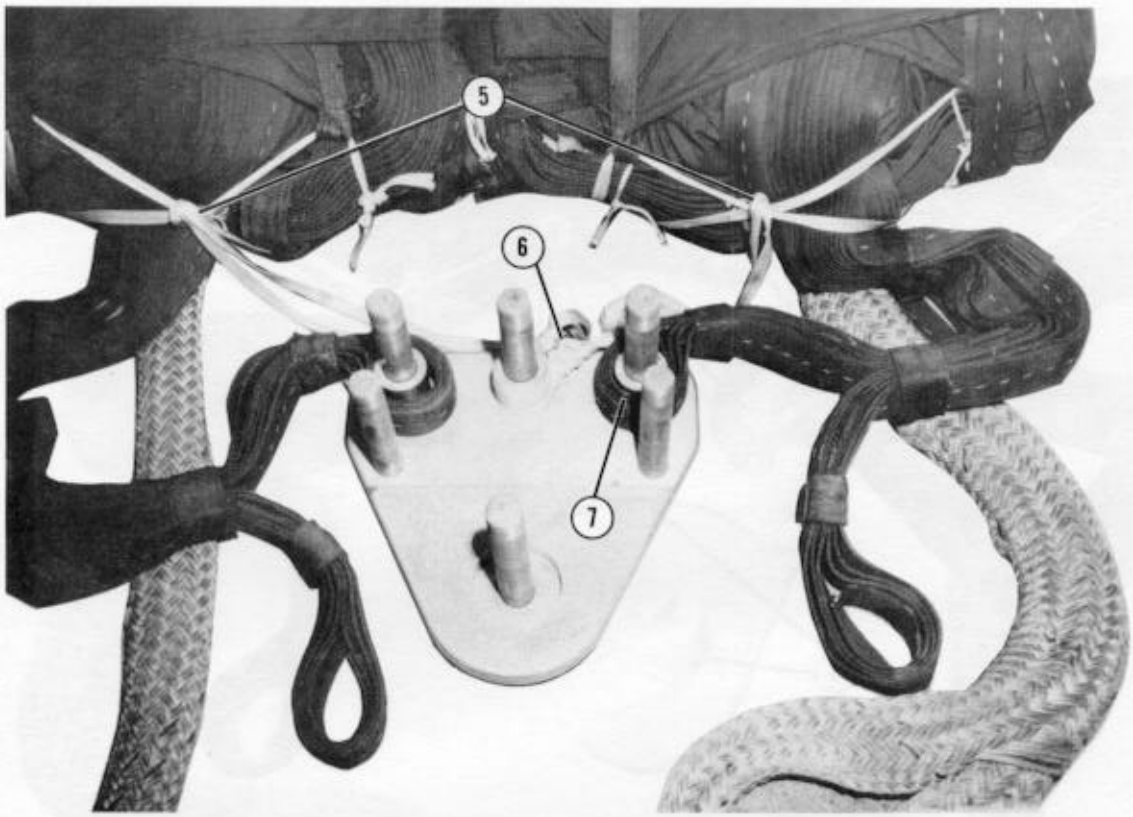
(2) Place the small bolts in the middle holes of the baseplate.

(3) Place a spacer on each of the three rear bolts.

Note: Make sure the miniature knives are routed through the X of the 1/2-inch tubular nylon webbing and safetied with one turn double of ticket number 5 or 8/7 cotton thread.

(4) Place the lower right parachute adapter web around the right spacer on the rear of the baseplate.

Figure 3-96. Aft extraction clevis assembled and attached to parachutes



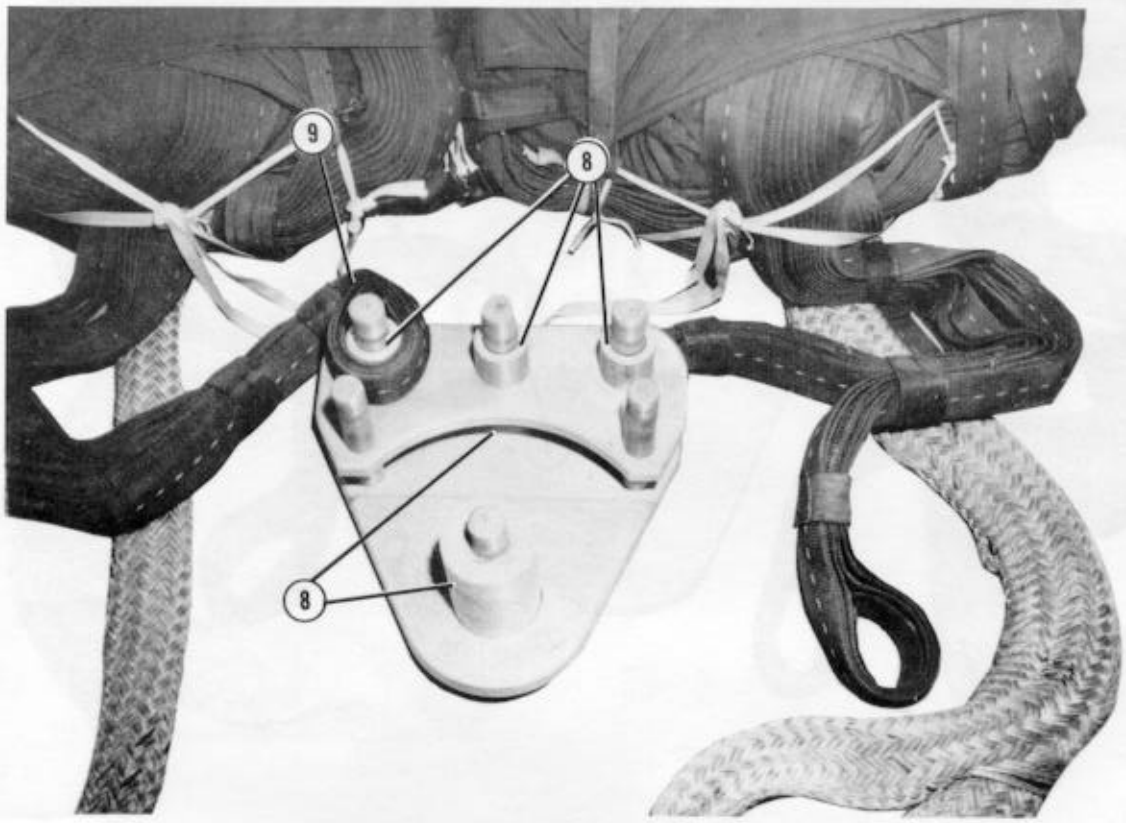
(5) Girth hitch a 72-inch length of 1/2-inch tubular nylon webbing to the miniature knives.

(6) Tie the ends of the 1/2-inch tubular nylon webbing to the center spacer on the rear of the baseplate with one turn, three alternating half hitches, and an overhand knot in the ends.

Note: Make sure the link is no more than 20 inches from the parachutes after the tubular nylon webbing is tied.

(7) Place the lower left parachute adapter web around the left spacer on the rear of the baseplate.

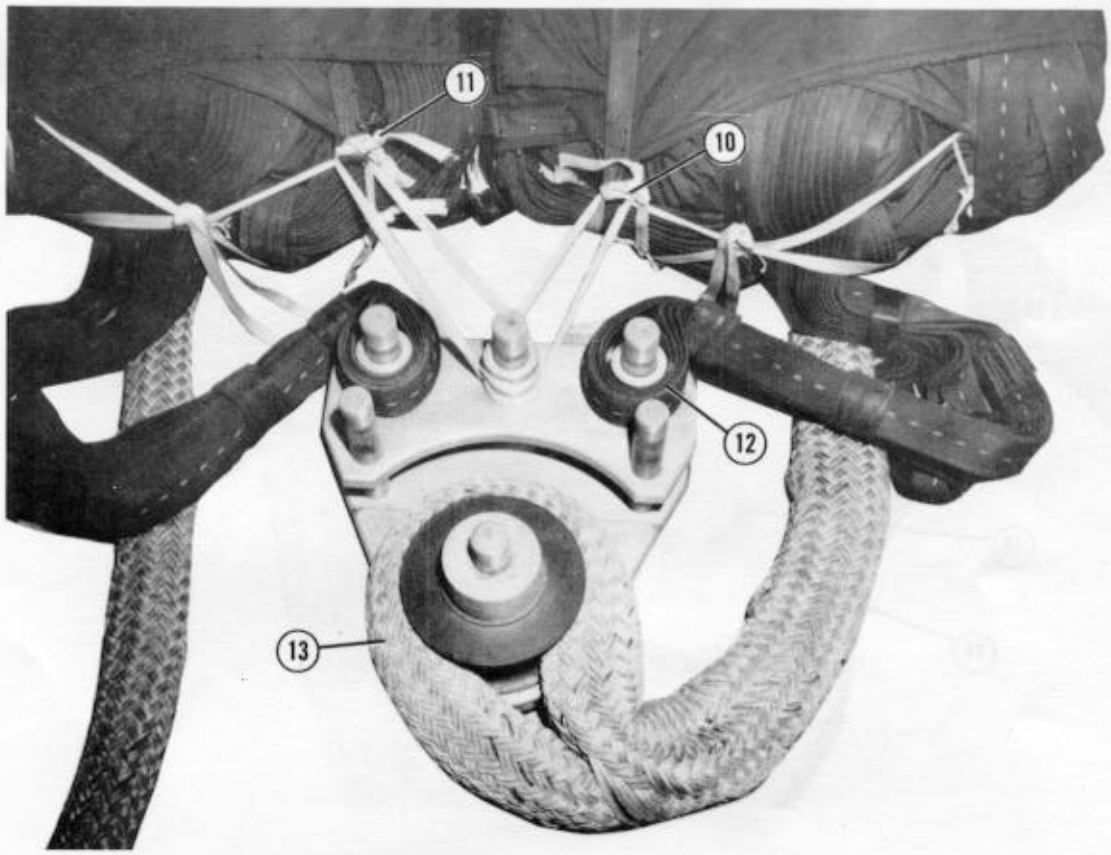
Figure 3-96. Aft extraction clevis assembled and attached to parachutes (continued)



(8) Place the center plate on the lower left and right parachute adapter webs and bolts. Place a spacer on each of the three rear bolts. Place a spool insert on the front bolt.

(9) Place the upper right parachute adapter web around the right spacer on the rear of the center plate.

Figure 3-96. Aft extraction clevis assembled and attached to parachutes (continued)



(10) Tie a 36-inch length of 1/2-inch tubular nylon webbing around the center spacer on the rear of the center plate. Tie the ends of the webbing to the left parachute riser protector flap loop.

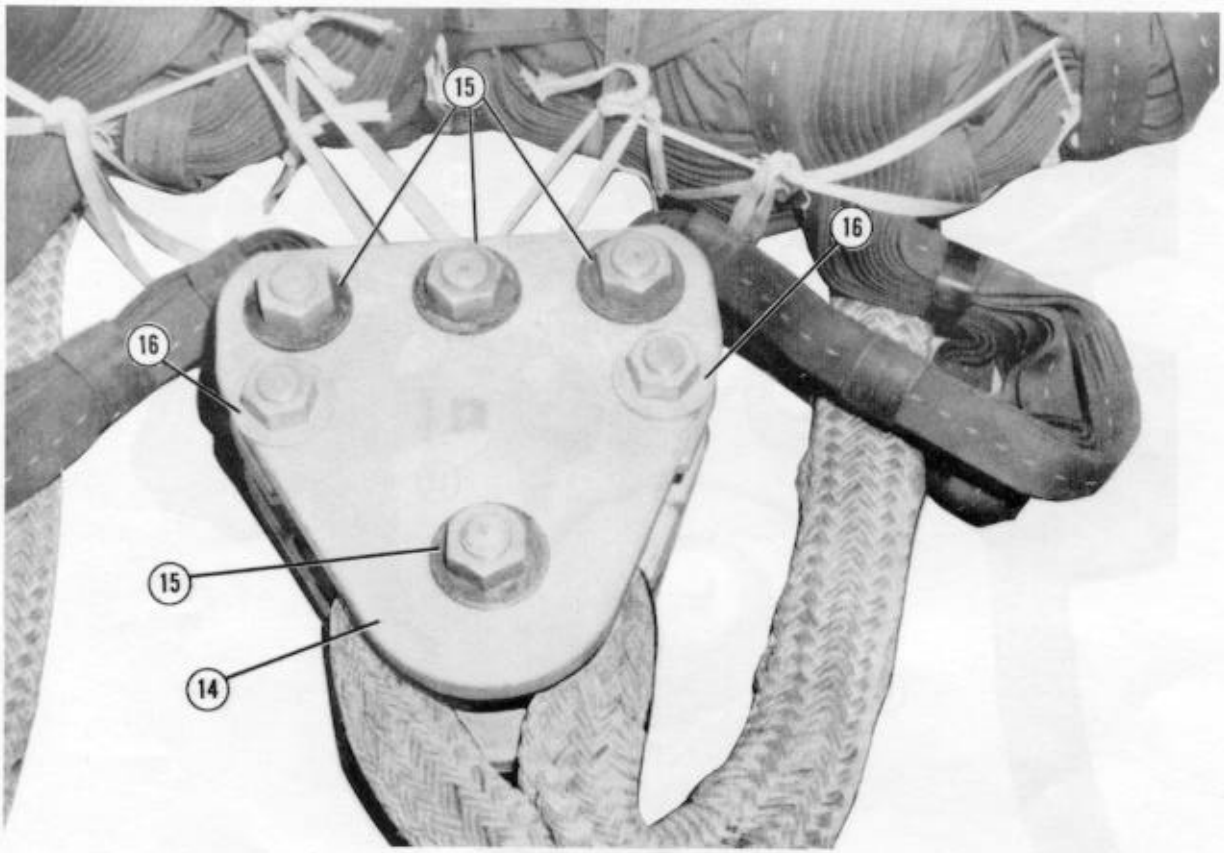
(11) Run another 36-inch length of 1/2-inch tubular nylon webbing around the center spacer on the rear of the center plate. Tie the ends of the webbing to the right parachute riser protector flap loop.

Note: Make sure the link is no more than 6 inches from the parachutes once the tubular nylon webbing is tied.

(12) Place the upper left parachute adapter web around the left spacer on the rear of the center plate.

(13) Place the 36-inch end of the rope around the spool insert.

Figure 3-96. Aft extraction clevis assembled and attached to parachutes (continued)



(14) Place the top plate on the bolts with the grooved portion facing down.

(15) Place the large washers and nuts on the three rear bolts and on the front bolt.

(16) Place the small washers and nuts on the middle bolts.

CAUTION

Do not overtighten the bolts, as this may strip the threads.

Notes:

1. Tighten the bolts wrench tight (not shown).

2. Secure a link protector over the extraction clevis as shown in Figure 3-93.

Figure 3-96. Aft extraction clevis assembled and attached to parachutes (continued)

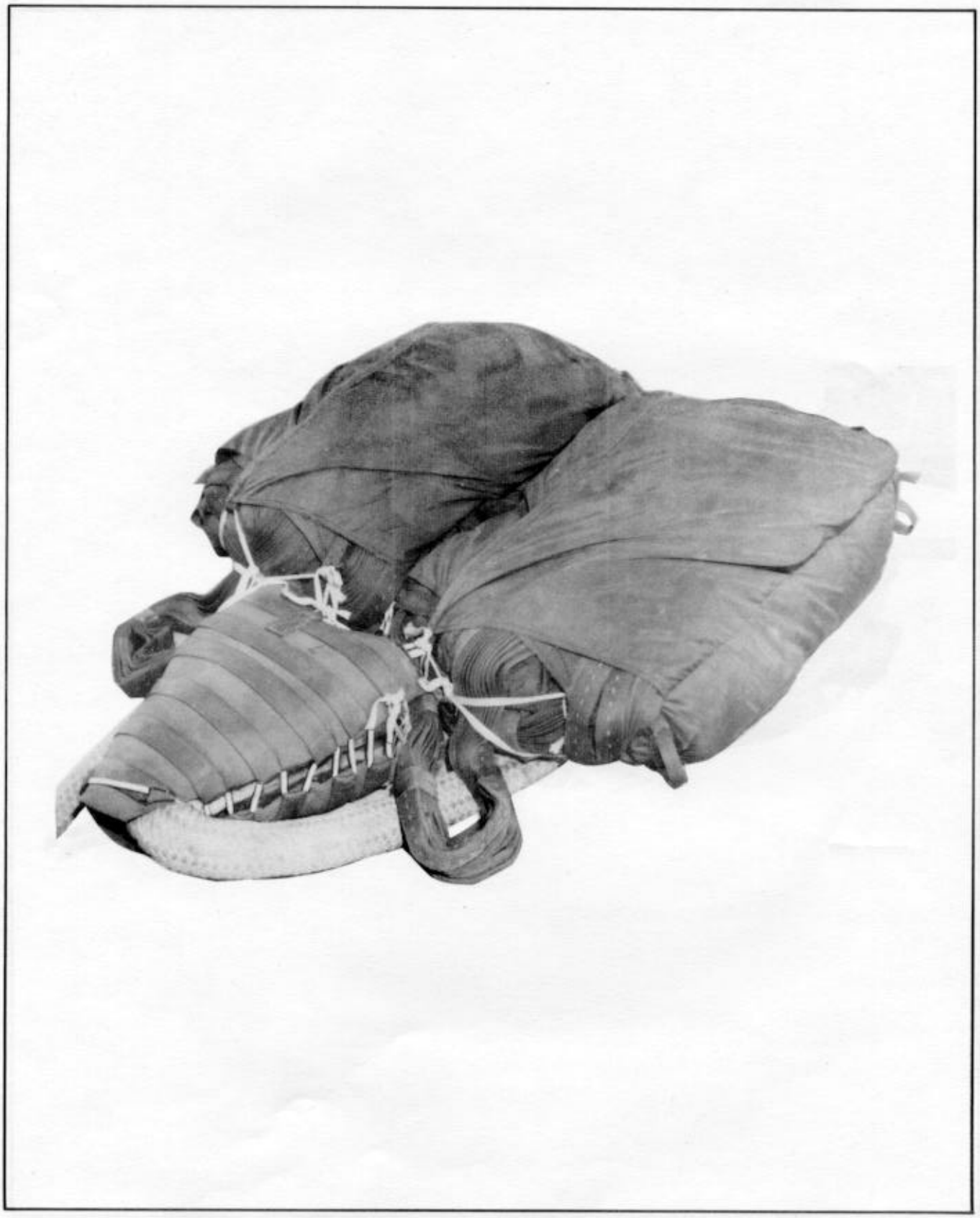
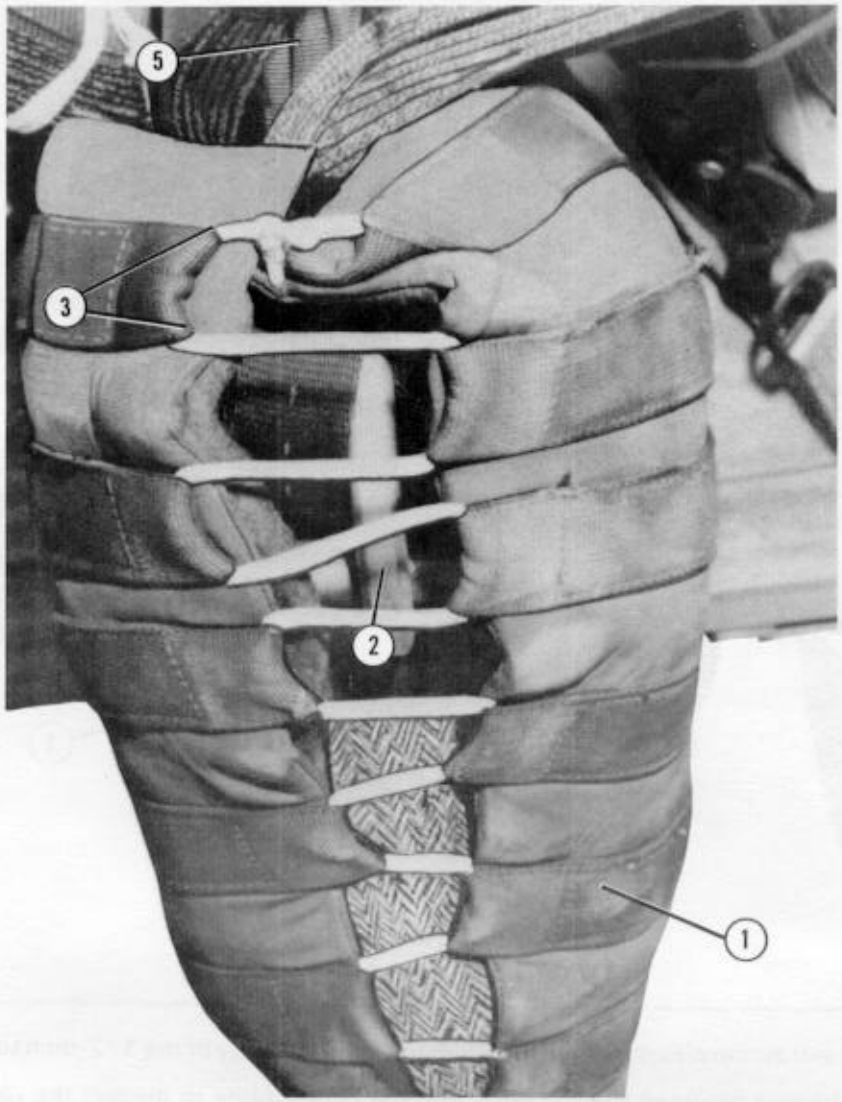


Figure 3-97. Front view of completely assembled aft extraction clevis attached to parachutes

Figure 3-98. Rear view of completed extraction system

Note: The airdrop inspector will inspect the forward and aft extraction clevises before the transport tray is positioned.



(1) Turn the forward extraction clevis to the left, and inspect the uniformity of the 1/2-inch tubular nylon lacing.

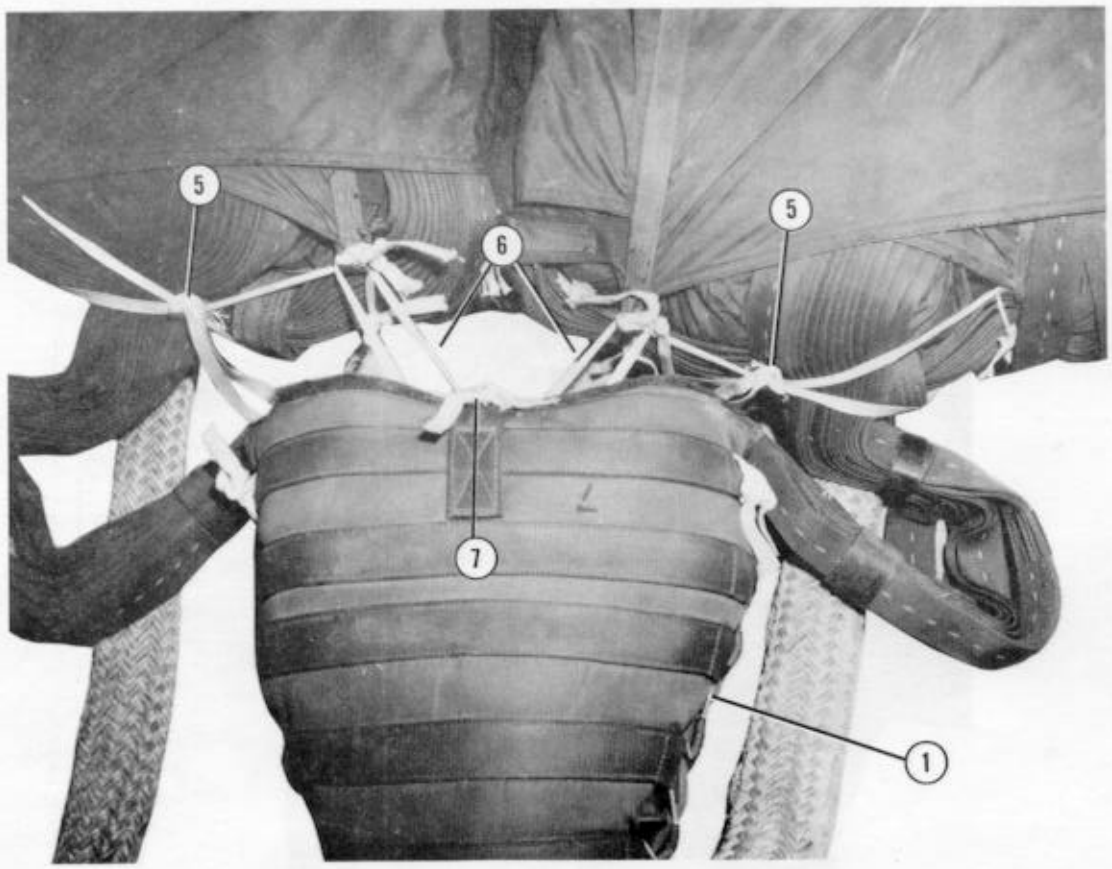
(2) Place your fingers between the top plate and the center plate to ensure all plies from the left extraction line are routed around the top right spacer on the rear of the extraction clevis.

(3) Inspect the tie on the link protector securing loops.

(4) Turn the extraction clevis to the right (not shown). Repeat steps 1, 2, and 3 above.

(5) Make sure that four turns of the 1-inch tubular nylon webbing are routed around the top center spacer of the extraction clevis.

Figure 3-99. Forward extraction clevis inspected



(1) Turn the aft extraction clevis to the left to inspect the uniformity of the 1/2-inch tubular nylon lacing.

(2) Place your fingers between the top plate and the center plate to inspect the upper left parachute adapter web (not shown) to ensure all plies are routed around the top left spacer.

(3) Repeat step 2 above for the lower left parachute adapter web and bottom left spacer (not shown).

(4) Turn the extraction clevis to the right (not shown). Repeat steps 1, 2, and 3 above for the upper and lower right parachute adapter web and spacer.

(5) Inspect the routing of the 1/2-inch tubular nylon webbing through the miniature knives to the lower center spacer.

(6) Inspect the extraction clevis retaining ties routed around the top center spacer and tied to the parachute riser protector flaps.

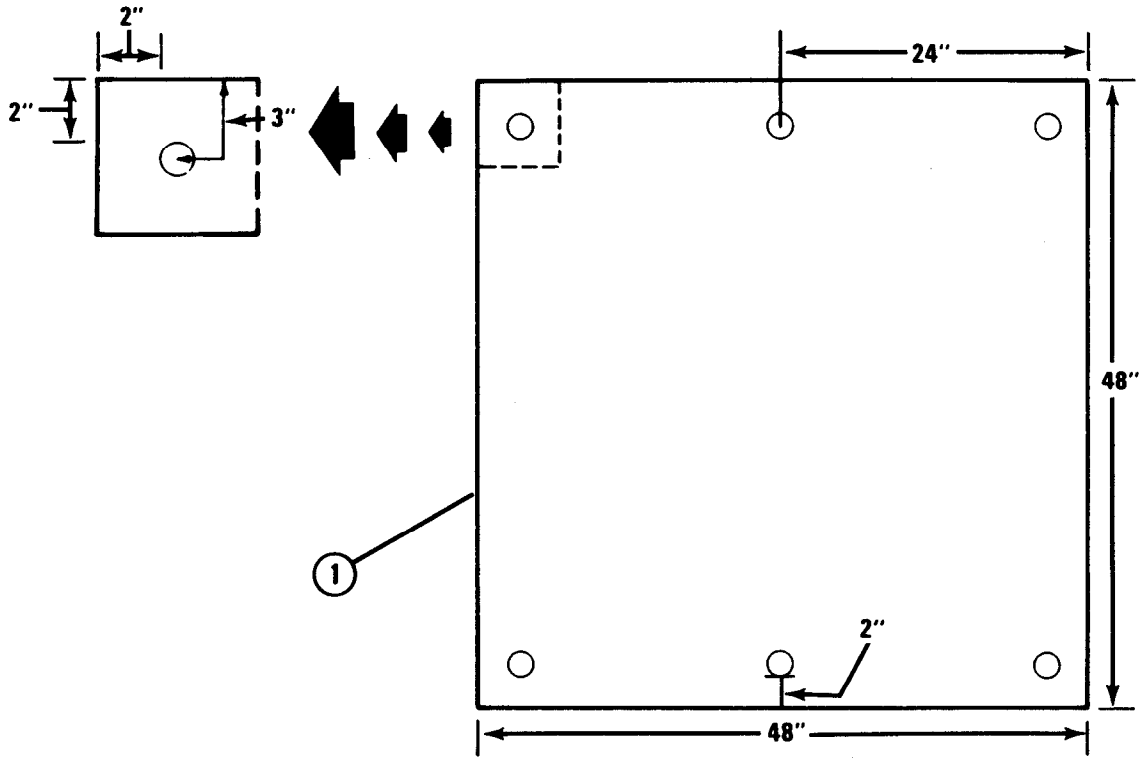
(7) Inspect the ties of the link protector securing loops.

Figure 3-100. Aft extraction clevis inspected

CAUTION

The transport tray will only be used during the transportation of the parachute system from the rigging facility to the aircraft. This tray will be removed prior to the after-load joint airdrop inspection.

Notes:
1. These drawings are not drawn to scale.
2. All holes are 2 inches in diameter.

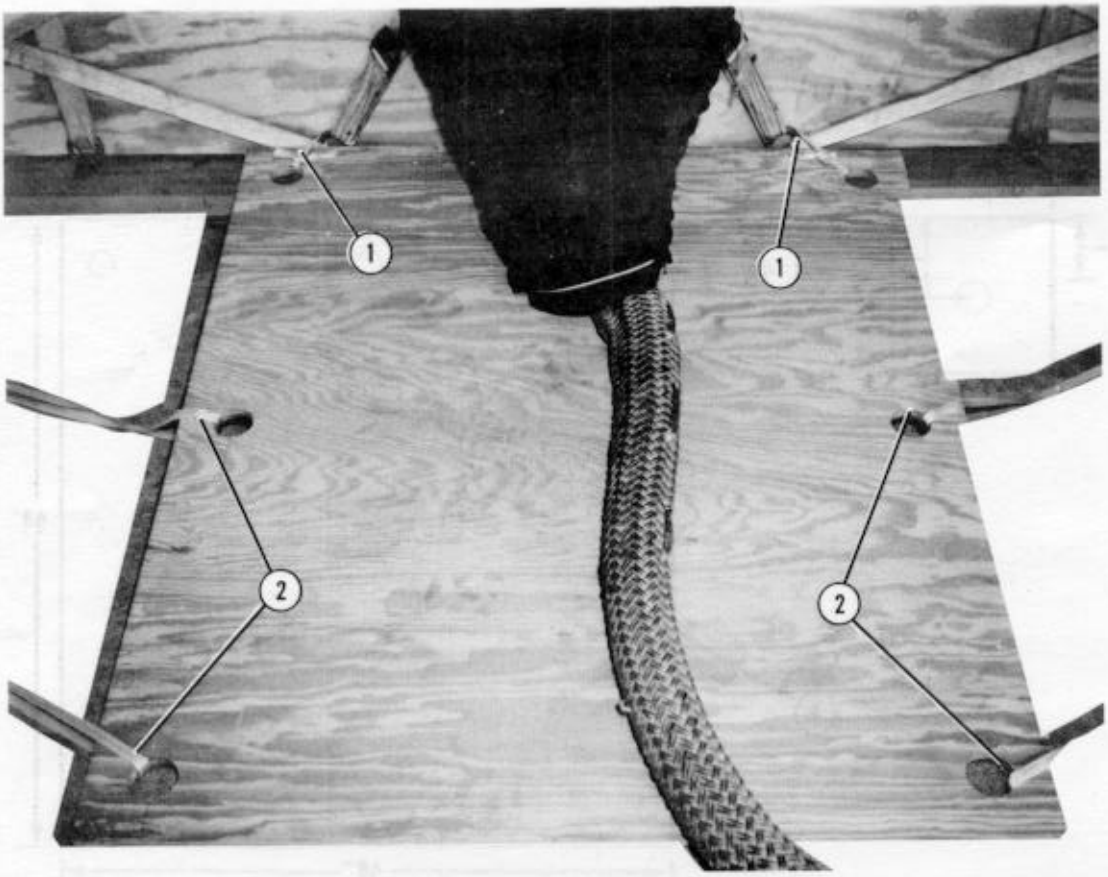


(1) Build a parachute transport tray using a 3/4- by 48- by 48-inch piece of plywood as shown.

Figure 3-101. Parachute transport tray built

Notes:

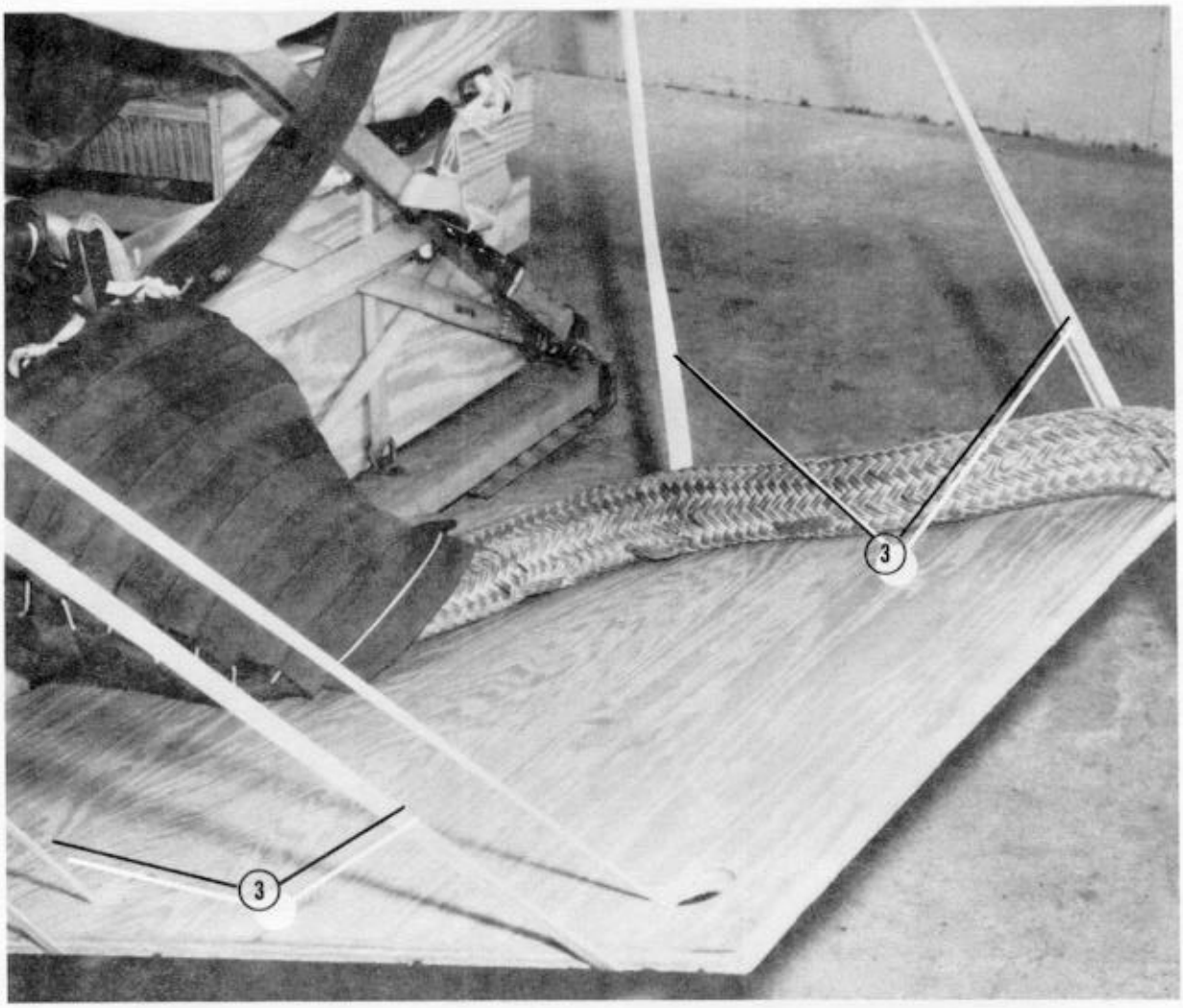
1. The length of the 1/2-inch tubular nylon webbing will be determined by the vehicle type and convenient attaching point.
2. The attaching point of the 1/2-inch tubular nylon webbing will be determined by the platform panel with the four tiedown rings.



(1) Secure the parachute transport tray to the end platform panel with 18-inch lengths of 1/2-inch tubular nylon webbing.

(2) Route a length of 1/2-inch tubular nylon webbing into each of the remaining holes.

Figure 3-102. Parachute transport tray positioned



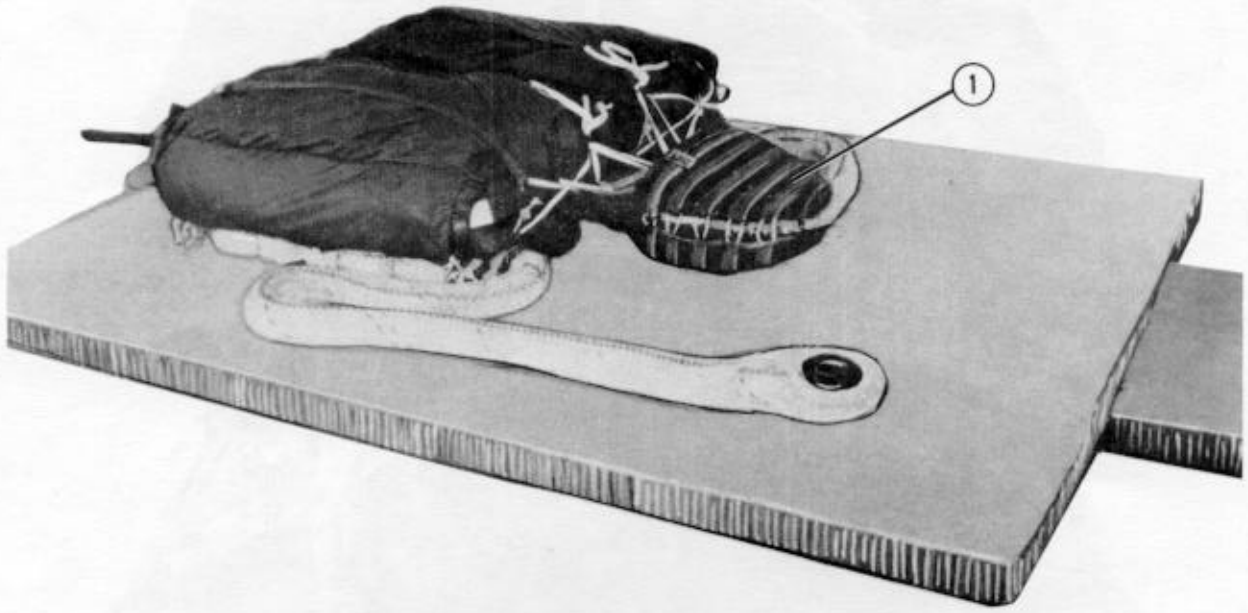
(3) Tie the lengths of 1/2-inch tubular nylon webbing (step 2) to convenient points on the load at approximately a 15-degree angle.

Figure 3-102. Parachute transport tray positioned (continued)

(1) Lift and place the parachutes on the parachute transport tray with the rear extraction clevis positioned toward the rear of the load.

Figure 3-103. Parachutes placed on parachute transport tray

Note: Honeycomb is used for photography purposes only.

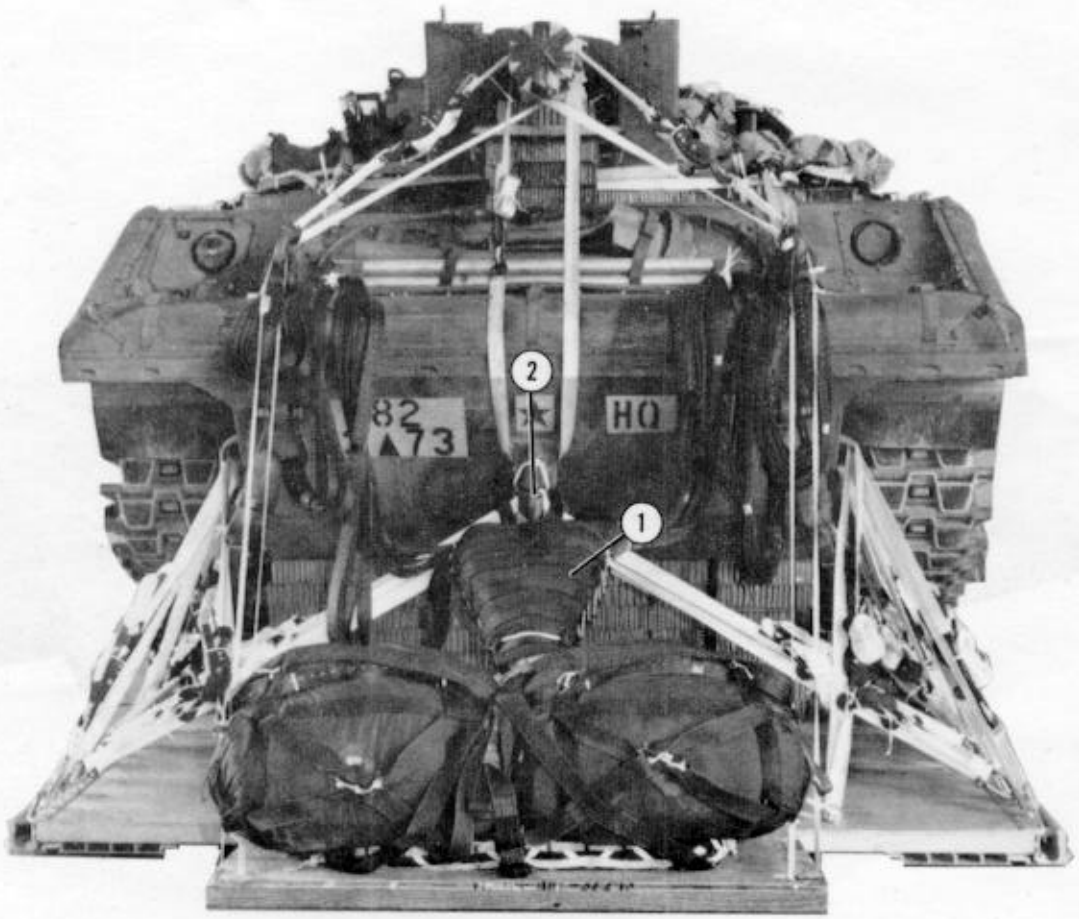


(1) Assemble and attach the aft extraction clevis to the parachutes as shown in Figure 3-96.

(2) Build a parachute transport tray (not shown) as described in Figure 3-101.

(3) Place the complete parachute system on top of the parachute transport tray (not shown) and transport the completed parachute system to the aircraft.

Figure 3-104. Parachutes prepared for transport to aircraft



(1) Remove the bolts, washers, and top plate of the forward extraction clevis as attached in Figure 3-94.

(2) Attach the 11-foot end of the rope to the spool insert of the forward extraction clevis as shown in Figure 3-92.

Note: Once the parachute system is attached to the forward extraction clevis, remove the transport tray and lay the parachutes on the aircraft floor.

Figure 3-105. Parachutes installed to load after transport